GARDEN CINDERELLAS

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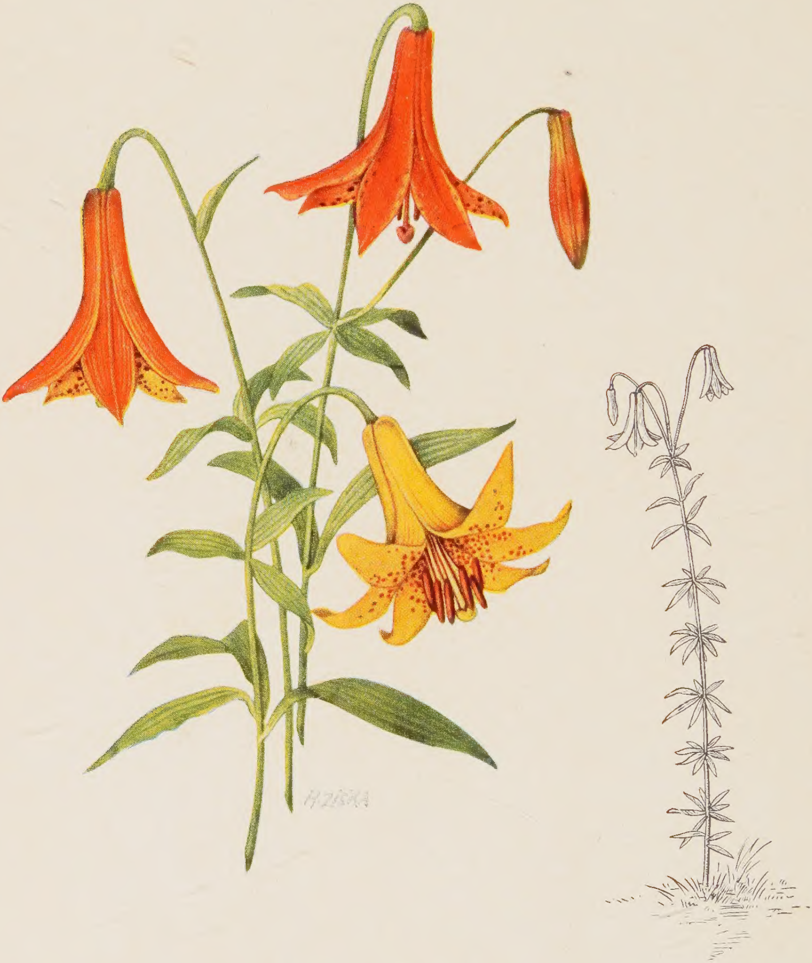

L. canadense. These three grew in one clump.

GARDEN CINDERELLAS

HOW TO GROW LILIES IN THE GARDEN

BY

HELEN MORGENTHAU FOX

WITH A FOREWORD BY

ERNEST HENRY WILSON

New York
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TO

MORTIMER J. FOX

. . . "that as many herbes and flowers with their fragrant sweet smels doe comfort and as it were reniue the spirits, and perfume the whole house; even so much as men live virtuously, labouring to doe good and profit the church of God and the Commonwealth by their paines or penne, doe as it were send forth a pleasing savour of sweet instructions, not only to that time wherein they live and are fresh but being drye withered and dead, cease not in all after ages to doe as much and more." — JOHN PARKINSON, "Paradisi in Sole," 1629.

FOREWORD

Since the dawn of culture among the peoples of central and western Europe Lilies have been known and cultivated. Earlier, among the Greeks and Romans they were favorite flowers. In "Das Buch der Natur," the oldest book in the Library of the Arnold Arboretum, published at Augsburg by Johann Bämler on October 30, 1475, there appears on page 224 a figure of the Madonna Lily. The illustration is crude but is the earliest, so far as I know, on record. In "Gart der Gesuntheit," which was published by Peter Schöffer at Mentz in 1485, under caption CCXXIX, there is quite a good picture of this same Madonna Lily. That pictures of a Lily should appear in the earliest of printed books, goes to prove the appreciation of the ancients, although it is true that this appreciation was more for their supposed medicinal qualities than for their beauty.

Since those early times the art of gardening has advanced enormously and gardeners have mastered the principles of growing a hundred and one different flowers. Yet strange as it may seem, the Lily is not one of these. Certain species of Lilies can be grown without difficulty while others simply linger and fade away. At any one period in the history of gardening in Europe plantsmen successful with Lilies in variety could be counted on the fingers of both hands. Men like the late Max Leichtlin of Baden-Baden and G. F. Wilson in England were famed for the success they had with this flower. In this country the growing of Lilies out of doors is quite a recent venture. The florists in greenhouses grow certain varieties by the tens of thousands but in the outdoor garden very few have so far attempted to make a specialty of the Lily. Yet there are a score and more of species that can be grown with comparative ease and supply a succession of blossoms from early June until late October.

There have been spasmodic efforts to make the Lily a popular flower but none has succeeded. Lack of knowledge or want of appreciation of the conditions under which Lilies grow wild or both have had much to do with this non-success. Other potent causes of failure have been coddling and overkindness. That a number of species will, for one reason or another, remain difficult subjects in any particular garden, goes without saying, but that more can be grown is equally true. It should be remembered that Lilies have a wide latitudinal and geographical range. Some are alpine plants while others are children of the tropics. Several species are best regarded as monocarpic, and advice to shrewd growers is ever to take opportunity of a capsule of seed and continue to raise new generations.

Of the long familiar plants in gardens few have been so much neglected by the writers of books on gardening. Articles in magazines are plentiful as the author's bibliography proves, but special treatises on the Lily are remarkably few. The public will, therefore, welcome this new book on a flower admitted to be one of the loveliest known. They will welcome it all the more since it is written by one who has been a close student of the genus for a number of years. If readers will emulate the perspicacity of the author and follow her sage counsel many of their difficulties in the growing of Lilies will vanish. The author's title of "Garden Cinderellas" is apt and all will heartily agree that the time has come for the Lily to take its rightful place in gardens.

E. H. Wilson.

Arnold Arboretum,
Harvard University.

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TO THE READER

THIS book is for the amateur, and is not a profound and learned tome where the reader must stumble or skip over the technical botanical terms. It is written for the gardener who longs to have a few Lilies in his front yard or in the flower border amongst the Columbines and Delphiniums, but does not know which ones to order or how to treat them after their arrival.

I have tried only to state what I knew to be true from my own experience or from that of someone reliable. My information has been gathered from kind and patient friends, from the study of herbarium specimens, books and papers, and from growing them for twelve years in my own gardens — five years in one and seven in another.

In order to see the rare Lilies and the ones which have been discovered but are not yet grown here in America I went to the herbaria of the Smithsonian Institution at Washington, the New York Botanical Garden, the Gray Herbarium at Harvard, and the Arnold Arboretum, where Mr. Wilson very kindly allowed me to go over his specimens, records, correspondence, and photographs. In these scientific strongholds are rows upon rows of fireproof cabinets filled with folded sheets on one side of which is pasted the precious dried plant. These mummified remains of the living flower do not reveal the treasures of an Egyptian tomb and yet they tell us more than we might expect. From them we can measure the height of the stem, the size of the bulb, leaf, and flower, and can see how far below the surface of the soil the bulb was found and, if the stem roots are present, can study their character. The measurements all apply to the wild plant growing in its native habitat and are valuable for that reason.

On the herbarium sheets are notes of where the plant was found. Sometimes they add when it flowered and the geological formation of the soil and growth which surrounded it.

In the library of the Department of Agriculture at Washington I found all that has ever been published on Lilies to the present time. At my request the valuable old herbals, botanies, and flower monographs were piled on my desk as nonchalantly as if they were so many newly published novels. It was a privilege to touch the creamy rough surface of such famous old herbals as Parkinson or Clusius and read their quaint descriptions. One day I had Redouté's "Les Liliacés" in my hands and when I found it contained only a few of the true Lilies felt quite like the fox in the fable because the price has always kept it way out of my reach. A study of the loving work of these beginners of botany fills one with an increased respect for their accomplishments, especially remarkable when we realize that they possessed none of the efficient concomitants of the scientists of to-day in the way of microscopes, or modern libraries with card catalogs and bibliographies. Their erudition makes us feel very humble about our much vaunted scientific accomplishments.

The information found in these hand-tooled books redolent of leather is delightful and interesting historically but has no practical value. Flowers are born anew every spring and come to us fresh and young. The laurel which crowned the brow of the victorious generals of ancient Rome will produce its glossy leaves just as triumphantly to-day. Plants can unfold and develop only the qualities inherent in the seed and are not burdened with having to live up to the traditions of their past.

Here in America we have not grown many Lilies either of our own or of foreign origin until lately. We have been as conservative in our gardening as in our beliefs and have not welcomed the new or unknown. The Lilies have truly been Cinderellas and invited to the Ball only at the last moment. That explains why up to within twelve or fifteen years a large proportion of the material on Lilies was written by the English, Belgians, or French. All but two of the books devoted solely to the Lily are English and one of these was written by an Englishman living in America. The value of the English books is their accounts of the habits and behavior of the European species in their native environment and in the gardens of Europe. With their choice language, beautiful printing and illustrations, and thorough handling of the subject matter they set a standard for Americans to follow. Mr. Elwes' book, "Monograph of the Genus Lilium," is one of the most beautiful monographs on any flower and is a work of art.

The best new book on Lilies is Mr. Ernest H. Wilson's "The Lilies of Eastern Asia." The articles of Miss Isabella Preston of the Dominion Experimental Farm at Ottawa, who is doing splendid work, are excellent. She has experimented with the seed production of Lilies and by dusting the pollen of several other varieties upon hitherto sterile flowers has induced them to set seed and has raised the offspring of these mixed marriages. She has also tested the hardiness of many different Lilies in her severe climate under ordinary garden conditions. Dr. A. B. Stout of the New York Botanical Garden has also been working on the seed setting of Lilies and his reports are valuable, as are the bulletins of the Department of Agriculture by Dr. David Griffiths who has been hurrying Easter Lilies into an early maturity from seed to show the commercial growers how to quickly acquire a large, healthy stock. He has also published bulletins on candidums and regales and has started a government Lily farm at Bellingham in the state of Washington.

I have tried to give credit for all the information derived from others, but sometimes may have forgotten that I read or heard a statement and think it was my own idea or may claim to have discovered something, not knowing it has already been noted by someone else.

Everyone has been so kind to me and so many people have helped me that there is a long list to thank. First I wish to thank Mr. Ernest H. Wilson, then Mr. Leonard Barron who has read over my manuscript and corrected it, Dr. William Crocker who made it possible for me to have Dr. Orton's and Mr. Carl Guterman's assistance in describing the diseases of the Lily, Mr. Carl Purdy, Dr. David Griffiths, Mr. William N. Craig, Miss Isabella Preston, Mr. Hugh Findlay, Mr. J. Horace McFarland, Mr. John Scheepers, Messrs. C. P. and F. Horsford, Mr. Roy E. Pierce, The Yokohoma Nursery Company, Mr. W. E. Marshall, Mr. Stephen F. Hamblin, Miss Ellen Shipman, Mr. H. E. Allanson, Mr. C. H. Fray, Mr. Anderson, the gardener of Mrs. Bayard Thayer, and all the others who so patiently answered my questionnaire, many queries, and letters.

HELEN M. FOX.

July, 1927.

GARDEN CINDERELLAS

L. regale, raised from seed at Foxden, fourth year after sowing.

GARDEN CINDERELLAS

CHAPTER I

WHY LILIES?

WHEN the Daffodils are blooming we begin to look for the Lily shoots. Some of them come up with the first spring bulbs, but others do not start out to see the world until the Darwin Tulips are parading through the garden with the Lilacs watching them from over the wall.

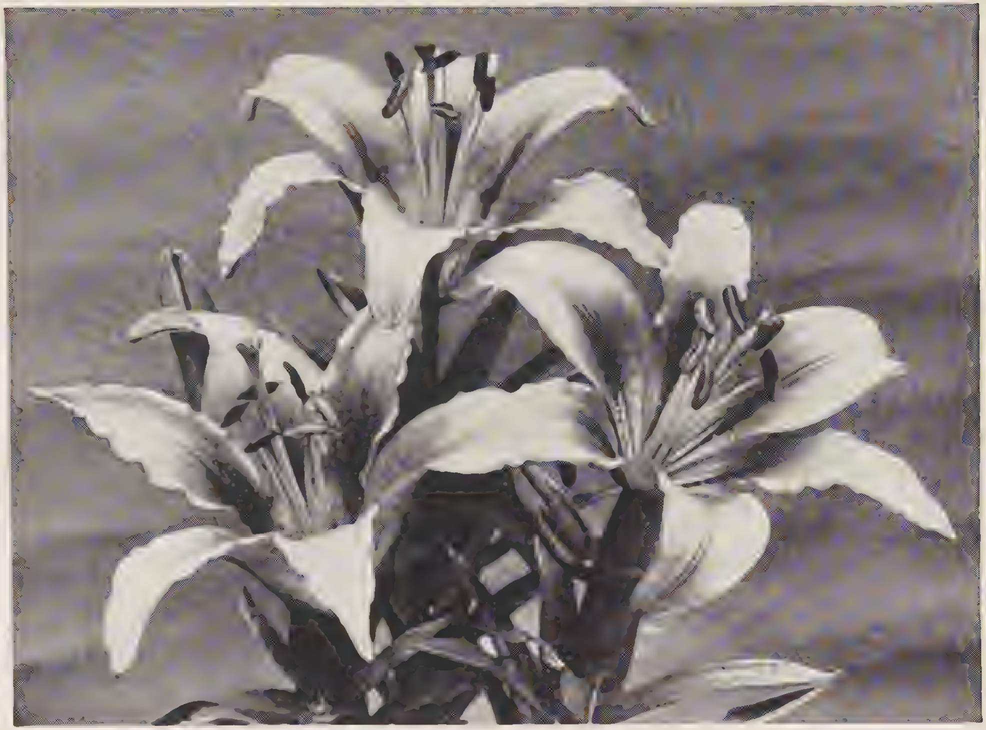
The single stem rises straight from the bulb and breaks through the earth. It is clothed with leaves which slowly unfurl and bend out. As the stem grows up into the air it carries the tight cluster of unborn flowers at its summit.

The Lilies take up so little room that a host of them can grow in amongst the Spanish Iris, Lupines, and Violas, and not be noticed until they open, when they attract every eye. The flowers stand out strongly like forceful personalities and do not merge into the colorful mosaic surrounding them in the borders.

The upright umbellatums (subspecies davuricum) are the first to open and bring a burst of scarlet and orange as the early Iris are fading away. Then come the tiny tenuifoliums, and the procession, which keeps on until frost, is under way. In July, as the candidum is leaving and the regale arriving and these two finest of all the Lilies meet, the Lily season reaches its height. These stars are surrounded with many lesser satellites and sometimes as many as twelve different ones shine at a time.

At twilight their fragrance calls us into the garden. As the Roses, Petunias, and other colorful flowers gradually fade out in the gathering dusk, the white Lilies stand out like friendly ghosts. At last they, too, melt into the velvety night, black except for the flashing of lightning bugs and redolent with the delicious scent of the Lilies in the borders and Honeysuckle over the arbors. If the gods grant a moon during these two weeks, their trumpets shine all night and softly blow their fragrance until the cool of dawn.

The Lily is a rhythmic flower. We feel this without knowing why until we look closely and see that the parts fall into a rhythm of threes. There are three inner and three outer sepals, six stamens, a three-lobed stigma, and a three-parted ovary with six cells. The Lily is not extravagant with its stamens as the Buttercup, or profuse with its petals as the Rose, but provides just enough to insure posterity the golden mean between prodigality and miserliness. This restraint is part of its beauty.



L. elegans aurianticum, davuricum subspecies thunbergianum

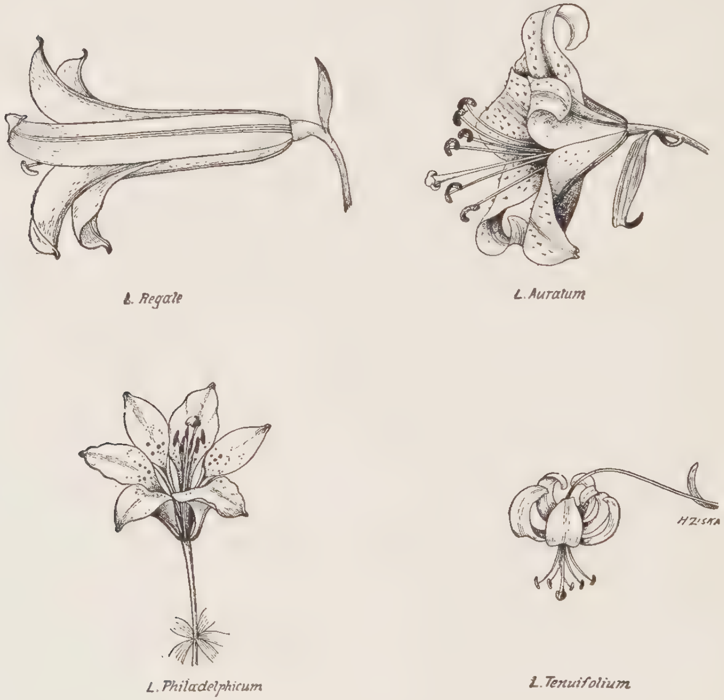
The buds on most Lilies stand straight up from the stem and when the time approaches for them to play their part in the pageant of the garden, the nodding ones turn down and slowly open until only the tips of the segments are caught together, then they turn out or roll back and reveal the pistils and stamens. Each part is clearly defined and frankly shows its purpose.

The flowers grow out directly from the stem instead of rising from a protecting green calyx. The perianth usually has three inner narrower and three outer wider segments. These outer ones are often more deeply colored on the back and form the envelope enclosing the bud.

The stamens peeping out from the bud are shaped at first like flat spades and often do not ripen until the flower has been open a few days in order to give it time to receive the visits of the bees and butterflies bringing the pollen from other flowers to dust on to the pistil. At their cue the stamens open and fold back on themselves, displaying their golden treasury of pollen. After they are ripe they dangle from the filaments, merely hanging on from one point in the middle. The pollen is always colored to harmonize with the flower from the palest yellow through to deep orange, red, or brown.

All of them are not chastely white or faintly colored. The bold members of the family flaunt burning reds and orange and even intensify these by dashingly applied beauty spots.

Some of the flowers are shaped like shining silver trumpets and some like the ruby and amethyst cup of the mystic Holy Grail, while others turn down like fairies' bonnets or swing out tinkling bells.



L. Regale

L. Auratum

L. Philadelphicum

L. Tenuifolium

Regale, not quite open, the trumpet-shaped flower; auratum, the bowl-shaped flower; philadelphicum, the upright cup-shaped flower; tenuifolium, the nodding, reflexed flower, called the martagon shape.

The Lilies do not disappear after their pinnacle of bloom in July, but have a series of lesser peaks all summer with no valleys of disappointment in between. In the middle of July, as if we had not enough wealth with Gladioli, Campanulas, and drifts of colorful annuals, suddenly the auratums open their glorious white and gold above the rosy Phloxes. August brings the henryi, speciosums, and tigrinums. As each Lily fades we could not bear to see it go if we did not know that another beauty was preparing to take its place.

The Lily is the flower for the discriminating. Because some of them are capricious they tempt the skill of the gardener, who enjoys wooing them into settling down to comfortable domesticity. Many lovely ones have as fine dispositions as their faces are fair and are sensitive and responsive to loving care.

The time has come for the Lilies to take their rightful place in rank next to the Rose. The Rose is still the reigning sovereign and requires much more pampering than the humble Cinderella-like Lily, which has only recently left the ashes of neglect to come to court.

CHAPTER II

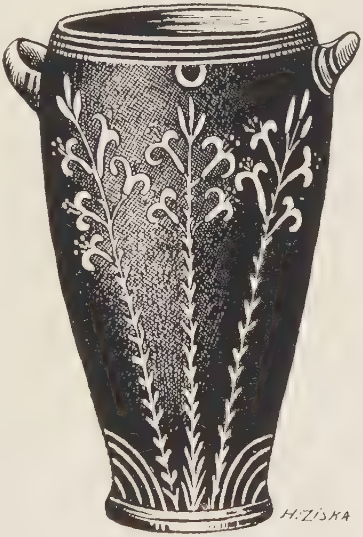
THE LILY'S PAST

THE Greek story of the origin of the Lily has often been told. How Zeus, the philanderer, wishing Hercules, his son from the mortal Alcmena, to be suckled by his lawful wife Hera to give him immortality, had the child put to her breast while she slept. When the future strong man awakened her by his powerful suckling she was so indignant at the trick which had been played that she pushed him sharply from her, causing him to spill the divine milk. The creamy liquid trickled down from high Olympus through the sky and formed the Milky Way, but a few drops fell further until they reached the earth where they turned into snowy Lilies — a poetic end to a practical joke of doubtful taste.

This amusing story is obviously a later version of an older earlier myth and did not tell where the Lily first derived its sacred association. I found an explanation in Gustave Glotz's "The Ægean Civilization," describing the excavations in Crete which uncovered ruins of a civilization possessing all the refinements and conveniences of living from plumbing fixtures to decorative table appointments.

Mainardi—"The Virgin and the Child," from the Louvre

The great Cretan divinity, Diktyma, was the goddess of fertility and of all the emblems associated with her the one she favored most was the stalk with three flowers, each flower with three parts, the Iris or the Lily. Three was the holy number. In all the drawings and statues of the goddess the triangle representing the sex organs was exaggerated, as the breasts were multiplied, to emphasize the abundant fertility of the great mother, the source of all life, who gave birth to new generations of children and brought forth the richly bearing crops. The people were entirely dependent upon her fruitfulness, for her sterility would have meant their starvation and death. They worshiped her and sought her favor with offerings while the symbol of her fertility, the triangle — the number three — became sacred.



Cretan Vase, 2500–1500 B.C., from Glotz, "The Ægean Civilization," Alfred Knopf, 1925. Illustrating the use of Candidum Lilies.

The artists who designed the pottery for which Crete was justly famous used the sacred flower, the

Lily, to decorate their work. One particularly fine jar, a reproduction of which is here shown, has the slender stalks of the candidum Lilies rising from its base and flowering at its rim. When we study the form of this Lily, we see how the column and capitol of the Ionic order might well have been inspired from the straight stalk and curling volutes better than from the Iris for which the honor is sometimes claimed.

The ancient kings who first thought of forging a divine ancestry for themselves to augment their power, adopted the trappings of the gods visually to impress their subjects, and that is how the Lily became a royal symbol. Glotz says, "The Lily, the emblem of royal state, would not have assumed a symbolic meaning if it had not first possessed a religious significance."

In the royal tombs of Mycenæ, where there was a civilization contemporary with the Cretan, it was found that a king had been buried with a golden crown of Lilies.

The sacred and royal associations of the Lily were handed down through succeeding cultures until the Christian era, when the ascetic philosophy strangely changed the pagan symbol so that instead of signifying abundant generosity and fertility it stood for the individualistic and inhibitive purity, the new holiness.

Our word "Lily" comes from the Greek "lirion," which means white Lily, and this is derived from the Persian "Laleh." In Japanese, Lily is "Yuri," and since there is no L in Japanese, one writer has suggested that Yuri may be the same as Lily. In French, Lily is "Lis," and there are two adjectives taken from this word, "lisse" and "luisant," both meaning smooth or glossy.

The herbals tell us how the knights and ladies living in the feudal castles of mediæval Europe made the most of the few flowers they could crowd into the small gardens inclosed within the protecting walls, and used the various parts of the plants for concocting drugs, flavoring their foods, or for beauty lotions and perfumes. From the old woodcuts and pictures we know that both white and orange Lilies had a place in their flowery meads and tiny beds.

Parkinson in his "Paradisi in Sole," a garden manual of Queen Elizabeth's England, tells somewhat skeptically how they had been and still were used medicinally. He says of the white Lily, *L. candidum*, "it hath a mollifying and digesting quality helping to suppurate tumors and to digest them for which purpose the root is much used. The water of the flowers distilled is of excellent virtue for women in trauvell of child bearing to procure an easie delivery as Matthiolus and Cammerarius report.

It is also used of divers women outwardly, for their faces to cleanse the skin and make it white and fresh."

Gerard in his Herbal dated 1597 says that the virtues of the red Lily, which is either bulbiferum or croceum, are as follows:

"A. The leaves of the herbs as Dioscorides teacheth being applied are good against the stinging of serpents.

"B. The same boiled and tempered with vinegar are good against burnings and heal greene wounds and ulcers.

"C. The roote rosted in the embers and pounded with oil of roses cureth burnings and softeneth hardness of matrix.

"D. The same stamped with honie cureth the wounded sinewes and members out of joint. It taketh away the morphew and deformitie of the face and taketh away wrinkles.

"E. Stamped with vinegar the leaves of the henbeam and wheat meale remooveth hot swellings of the stone, the yard and the matrix.

"F. The rootes boiled in wine saith Pliny causeth the cornes of the feet to fall away within five daies with remooving the medicine untill it have wrought the effect.

"G. Being drunke in honied water they drive out by siege the unprofitable blood."

The Arabs in Spain used the white Lily for poultices on wounds to stop the flow of blood. They undoubtedly brought it to Spain with them from Persia or Palestine. The Spaniards, in turn, carried it with them to California, where it has been grown since the days of the missionaries.

It is so easy to leap over great distances in our minds that we can now jump to the Far East, where we hear that the ancient Chinese and Japanese often grew the Lilies in pots to embellish their quaint courtyard gardens.

In both China and Japan the Lilies have always been grown for food. If they are permitted to flower, their vegetable gardens must look quite celestial, but perhaps they sacrifice the æsthetic to the practical and nip off the stalk below the flower cluster so that all the strength can be concentrated into the bulb.

The Lily has served as a nourishing food as well as a garden ornament and has functioned to fortify the body as well as glorify the spirit. Imazo Nitobe, in an article in *Garden and Forest* of 1896, tells us that the principal vegetable diet of the tall aborigines of Japan, the Ainus, which may account for their great height, has been the Lily with big heart-shaped leaves, *Lilium cordifolium*. The kinds most frequently used for cooking are the tigrinum, called Oni-Yuri (Ogre Lily) or Ryori-Yuri (Cooking Lily), strange juxtaposition of names, and the concolor var. pulchellum, called Hime-Yuri (Princess Lily). All the bulbs are rich in starch, and the Ogre and the Princess also contain a goodly amount of nitrogenous matter.

Before cooking them, first slice off the edges of the scales as they are bitter. They are generally boiled, sometimes with rice, and are eaten with sugar. The bulbs of longiflorum, called Tippo-Yuri (Gun Lily), we are glad to note are too bitter to be palatable, but the bulblets, alas! can be eaten roasted and the perianth segments of some varieties growing wild in Hokkaido make "an excellent, pretty salad." The best way to prepare the salad is to boil the segments and serve with a dressing of cream and eggs. If I were to go out into the garden and pick anything as lovely as a Lily to cook it for my dinner when something less gladdening to the eye might taste as good or better, I would feel like a gluttonous barbarian. But perhaps that is merely an ephemeral way of thinking, and some day we may be so highly developed artistically that we will eat only beautiful flowers and fowls with iridescent plumage.

Mr. Wilson says the davuricum and its subspecies thunbergianum and brownii colchesteri are also grown for food. Lilies can be bought cheaply by the pound from shops supplying the Chinese restaurants. Most of these, I am told, are tigrinums, but occasionally a brownii is found amongst them.

The plants of this genus are distributed over the Northern Hemisphere only, and some of them are native as far north as Canada and Siberia and as far south as Florida and the Neilgherry Mountains of India. With the help of man they have crossed the equator and are being successfully grown in the gardens of South Africa and New Zealand. There are eighty-one species altogether, many varieties, and a few hybrids.

They are first described in English in the herbals. Parkinson in his "Paradisi in Sole," in 1629, mentions the following Lilies, showing that they were known in Europe at that time: there were five varieties of martagon, the canadense, from the newly discovered land of America, pomponium, chalcedonicum, bulbiferum, candidum, pyrenaicum, and carniolicum.

In 1762, Linnæus, the father of systematic botany, as he is called, in his "Systema Plantarum" described candidum, bulbiferum, pomponium, chalcedonicum, martagon, canadense, and two new ones from the east coast of America, superbum and philadelphicum. He omitted pyrenaicum and carniolicum.

Many are described which were known only botanically and were not in cultivation. Croceum and candidum were common in the gardens of western Europe and still smile up at us over the fences of the French and English cottage gardens. In America, the explorers found and described the species growing on the Atlantic coast on almost their first visits to our shores. Although the Spanish missionaries surely knew of the Western kinds, I did not find any material about this. However, I read somewhere that the Indians made a soup of Lilies. The first records of the Western varieties came in the sixties when the gold rush had died down and the people had leisure to look about them and see the glorious vegetation native to the state.

Later in the nineteenth century they were collected and sent abroad. Mr. Carl Purdy, who has been collecting the bulbs of these sumptuous flowers ever since he went across the country in a prairie wagon, says it was only the English who cared enough about gardening to try out the new kinds and that he sold almost none at all at home, where we were still sunk deeply in the delights of Victorian flower beds shaped like stars and circles peppering our lawns. Since the last war we are buying and planting them at home, and what a thrill they give us!

At the meeting of the California Academy of Science in 1854, Dr. Kellogg read a description of his discovery of washingtonianum and in 1869 he described pardalinum and parvum.

Roezl discovered humboldtii on the centenary of Humboldt's birthday in 1869, a red-letter day for Lily lovers.

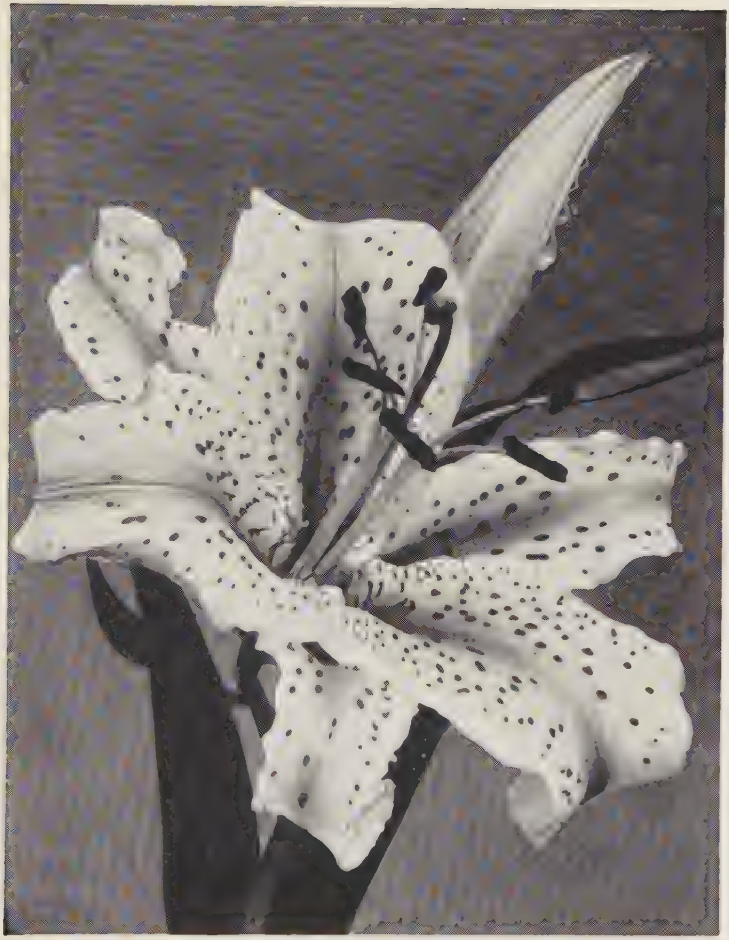
In 1876, Dr. Parry found parryi, and it was grown at the Harvard botanical gardens soon afterwards but, unfortunately, all the records of the plants grown there were lost, so we do not know whether they throve or perished. In 1872 Mr. Hanson described columbianum, and in 1878 Dr. Kellogg described maritimum.

How breathlessly one follows these men as they climb up into the Sierras in the shimmering light of a June day, and, led by an enticing fragrance, push their way through the underbrush to a clearing by a brook where in the flickering light of the encircling shrubs we find the flower which has been waiting all these centuries to be carried to where its grace and beauty can be appreciated by throngs of admirers.

In 1807, M. Duchartre in a paper on Lilies, "Observations sur le Genre Lis," Paris, 1870, tells the story of how an English seaman touched at Japan, and, along with the silks and spices in his cargo, brought home the Tiger Lily and one called "odorum," probably brownii colchesteri. They were, undoubtedly, given to him as articles of food, and, fortunately, he was wise enough to grow them first before cooking them. This auspicious initiation of Lily importation continued on through the nineteenth and into the twentieth century and inspired many explorers to search the mountains of India and Burma and travel as far as the Tibetan border in China to secure new and unknown beauties for our gardens.

The arrival from Japan of the auratum, which was exhibited at the Massachusetts Horticultural Society in 1862 by Francis Parkman in the same year it was shown in London, created a sensation, but, unfortunately, the beauty of the family brought trouble to her kind. It appeared capricious because it was misunderstood, and its weaknesses due to mishandling were immediately fastened upon the whole tribe. This had a dampening effect on the enthusiasm for Lilies. In the nineties the Bermuda Lily disease developed and there was more talk of the frailty of the Lily and soon it became a fixed idea that all of them were difficult.

Now we are beginning to know the causes of their sickness and seeming frailties, and within the last fifteen years have become much less timid about growing the Lilies. Science has come in to help us conquer disease, and we have learned to raise them from seed, obviating the necessity of a long and weakening journey of the bulb from its home. Then, many hardy new Asiatic species have been discovered and introduced directly into our gardens



L. auratum.

instead of reaching us by way of Europe with a story of failure in a different climate. Our hot summers, cold winters, and aggravating dry spells have their compensation by being just the right conditions under which to grow most Lilies.

Many Lilies living shyly tucked away in some modest garden have lately been drawn out of their retirement. Amongst these are callosum, tenuifolium, medeoloides, and cernuum, all of them dainty flowers taking easily to the garden. The roster of newly introduced débutantes includes the regale, the belle of them all, sargentiae, davidii, willmottiae, myriophyllum var. superbum, and leucanthum. On the whole their dalliance in our gardens has been short. Almost half of them were introduced only since 1870. Perhaps this explains why so much of the directions for their culture have been drawn mostly from fertile imaginations. Assembling the less-known Lilies at the present is like collecting rare jades or porcelains. But unlike the antiques which we cherish for their scarcity, cherishing the flowers will augment their number. Very soon they will not only be the choice possession of the fastidious collector but be available to all gardeners at low prices in increasing quantities.

CHAPTER III

WHAT'S IN A NAME?

MANY people enjoy nature impressionistically without knowing the names of the trees and flowers or the songs of the birds. To them the woods and fields are a kaleidoscope of color, sound, and smell instead of a haven of friendly faces and familiar voices. Lolling on a stone wall, they scornfully watch the scientist trudge by with a field glass swinging from his neck, a collector's box tied to his back, and pockets bulging with notebooks. Each is enjoying himself in his own way, but the scientist is reading deeper into nature and seeing a great deal of the beautiful and marvelous quite closed to the idler on the stone wall. The microscopes and botanies are the keys which open the doors to more thrilling love and mystery stories than were ever written. Science teaches its devotees to look sharply and remember every detail; they not only see what is there but have the fun of anticipating and relating things to each other. To them Jack-in-the-Pulpit, preaching from his spiral pulpit to the fluttery wildings of the woods, is a quaint contrast to his proper imposing relative the Calla Lily, and they know he

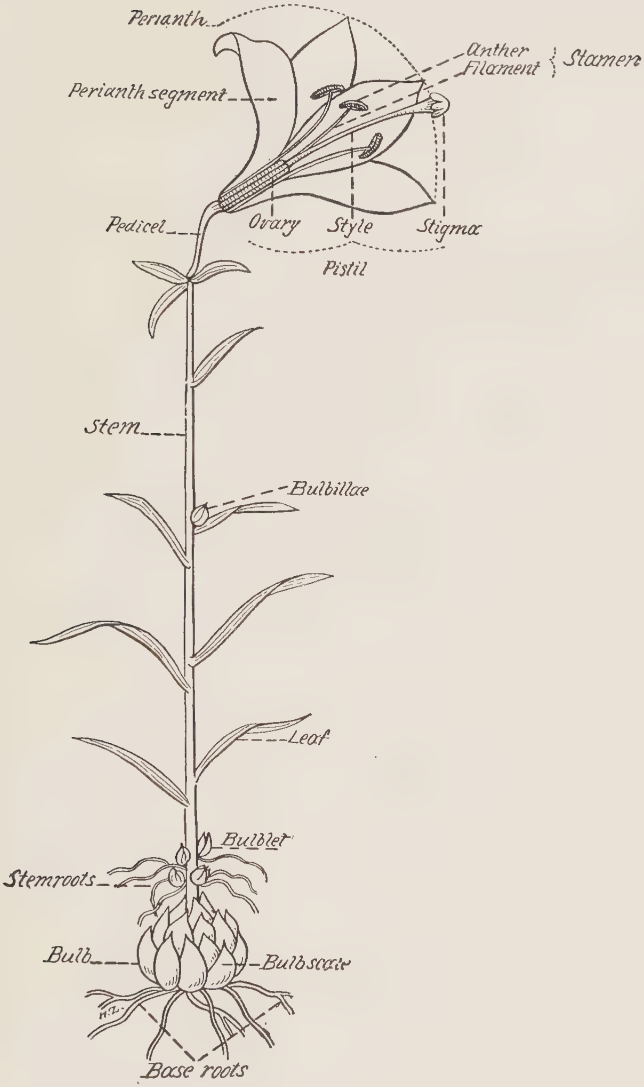


Diagram of Lily

will expose the true colors of his merry soul in the fall when his somber green cassock falls away and reveals a bunch of bright red berries. A familiar whistle announces that the red-winged blackbird is hovering near the margins of the pond and an eerie minor song that the wood thrush is down in the valley.

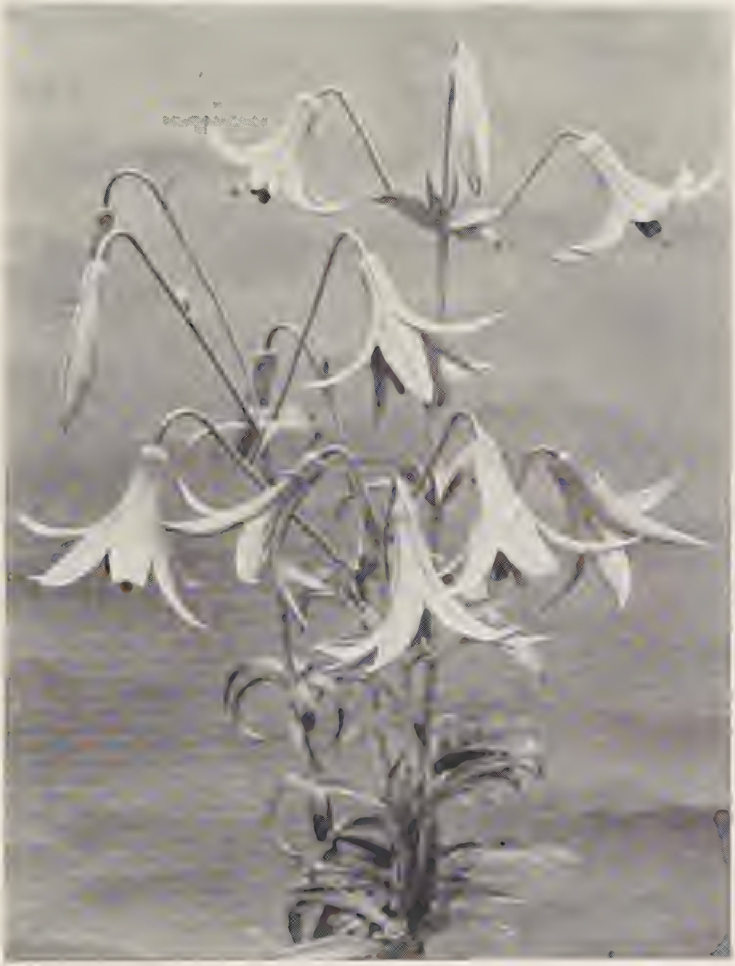
Our favorite flowers and birds ought to have descriptive and easily remembered names. Blue jay, scarlet tanager, red-winged blackbird, how poetic and descriptive they are! An appropriate and easily remembered name, such as Marigold or Primrose, is a winning introduction and helps the bearer to popularity. But what do Thermopsis, Hepatica, or Lilium polyphyllum call forth? — even to the few who remember their classics painfully acquired during the preparation for college.

Many of the Lilies are so new to our gardens that we are still in awe of them and diffident about calling them by their first names or giving them nicknames. At present only a few of them have "common" names, and the people who have daily intercourse with them find themselves chanting out long Latin names or using such subterfuges as "that one over there" or the "little yellow thing here." No doubt in time we will use the translations of the Latin or Chinese ones as we have already done for Tiger Lily, *L. tigrinum*, and Leopard Lily for *L. pardalinum*, and we will find folk names for them.

The Lilies must all have scientific names for purposes of being understood internationally. The scientists have adopted an Esperanto of their own long ago and meet at congresses where the erudite spend hours discussing where to use capital letters and where small ones. It must be exciting when they finally adopt the resolution: "Resolved that henceforth Lilium canadense Linnæus will no longer be Lilium canadense Linnæus." Just imagine how quickly the learned ones would drop a book which talked about Bouncing Bets, Johnny-Jump-Ups, and Joe-Pye Weeds.

After a plant has been discovered by an intrepid explorer who has traveled to the Tibetan Alps (the plant hunter's paradise) or some equally remote place in search of unknown vegetables to gladden the eye, enrich the menu, or perhaps to add to a botanical collection, the dead thing is usually sent with a brief note to a museum to be identified and named. Often the botanist in the museum who receives it has not seen it until the dried specimen reaches his desk. He measures it, compares it with others of its kind, and looks through the records to find out if it is a newcomer in the world of science. If so, he describes it in Latin and gives it a name inky from the typewriter and not blown off the rocky Alpine meadows. Often the flower is called after the discoverer, a gracious compliment, but when the gentleman answers to Maximowicz or Bieberstein it does not slip trippingly from the tongue. Think of tagging Brown or Baker onto a colorful, fragrant Lily. One might as well go through the telephone book for inspiration and have Smith's, Jones', or Cohn's Lilies. According to the rules of the game, the one whose Latin description is first published wins, and his title stands forevermore. His own name is affixed to the flower's so we know whom to blame; such as, Lilium candidum Linnæus. Sometimes he makes a plausible mistake and does not recognize the stark brown specimen to be the same as a species which has been gathering dust on the shelves of a museum for years. Then the poor flower bears two equally awful names until the error is brought to light.

Sometimes a flower bought under one alias turns out to be a princess traveling incognito, as happened last summer in my garden. For hours I sat entranced on the grass watching the opening of a Lily new to me, called sulphureum. There were no agonized birth pangs here but a silent unfolding of beauty in the warm summer sunshine. As the morning wore on into afternoon, the back of the waxy segments paled from greenish white to white, the inside slowly matured to an ivory-white with a lemony throat, and I found I was harboring unawares a myriophyllum var. superbum. It is a pity this



L. canadense.

Lily is not called sulphureum, which is so much prettier and describes it so well, rather than the long title it now bears.

In describing the flowers, the botanists who only know the dried specimens pasted to herbarium sheets lay too much emphasis on similarities and differences not important in the living plant, and although it is helpful to other botanists it is confusing to the gardener trying to identify the growing flower. Canadense, with its bell-like perianth, and superbum, with its deeply reflexed segments and emerald-green triangle in its heart, are strikingly different when swinging from their stems, but when dried and pressed look almost alike. Few botanists mention the differences of the flower's shape, but all of them say the distinction between the two is that the leaves of superbum are smooth on the back and along the edges while those of canadense are slightly hairy. This is important, but it is more helpful to the amateur to stress the characteristics easily seen without a microscope.

Often the Lily-of-the-Valley (*Convallaria majalis*), the Day Lilies (*Hemerocallis*), and the Funkias (*Hostas*) are incorrectly included in the genus Lilium. The Convallaria and Hemerocallis are sister genera to the Lilium and the Funkia is a Hemerocallis.

As this is not a scientific treatise, I have not gone into the classification of the genus. Those who wish to probe deeper into the subject will find the material in the copies of the English *Gardener's Chronicle* of 1870, where was published a synopsis of the genus Lilium, by Mr. J. G. Baker, which was the best and most complete to that time. Mr. Elwes used this classification in his beautiful monograph. Since then Mr. E. H. Wilson has given the latest synopsis of the Lilies covered by his monograph. The American ones have not yet been satisfactorily classified.

CHAPTER IV

DECIPHERING THE HIEROGLYPHIC*

THE whole story of the Lily is written in the bulb, although this is, as yet, only a partially deciphered hieroglyphic. Some people think that bulbs, like marble statues buried in the ground, remain unchanged except for acquiring a mellow ivory tone. Like all living organisms, they are ever renewing themselves, sloughing off the used parts and beginning on the next phase of the continuous cycle before the last is over.

When we think in terms of geologic ages, the rhizome and bulb are comparatively recent forms of vegetable growth which appeared after the tropical era was succeeded by seasonal climatic changes in the cooling world.

The bulb formation is common in arid regions with short rainy seasons. It is a permanently thickened underground portion of the stem whose purpose it is to store food for the plant, to provision it for the emergencies of drought, frost, or fire, and fortify it in the competition against stronger neighbors. It is a weapon contrived by the canny plant in the battle for survival constantly being waged in the seemingly peaceful world of nature.

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* In this chapter, in order to describe the bulbs in accurate scientific words, I have borrowed from Strasburger, Kerner and Oliver, and other botanists, and read up about them in Bailey, Wilson, and Baker.

The bulb is a metamorphosed subterranean shoot and the scales are changed leaves filled with a reserve of food. Kerner and Oliver say, "A bulb is really an erect subterranean shoot whose very thick short axis is covered with relatively closely packed scale leaves one above another," like the tiles on a roof, and "the aërial shoot of the bulb develops from its axis while new bulbs are formed from buds in the axils of the scale leaves."

In the fall the bulb consists of fleshy scales surrounding the faded flower stem, and within its heart is the bud containing next year's stem, leaves, and flower, while springing from its base are numerous roots which feed and anchor it. While the aërial shoot is pushing out into the soil, breaking through the crust of the earth's surface and rising into the air, it draws its nourishment from the bulb scales. As soon as it develops green leaves, it is able to manufacture organic material from them in the sunlight, and then it sends down nourishment to the bulb which begins to prepare next year's bud and new scales.

In the axils of the innermost scale in most species is the dead flower stalk, together with the young bud bearing a number of leaves, each provided with an embryonic blade, while the continuation of the shoot is the embryonic flower cluster. In the spring the shoots appearing above the ground, looking in some species like the fluffy tail of a little, long-haired dog, and in others like a tiny pineapple, consist of the rudimentary flower buds wrapped in a tight cluster of encircling leaves. That is why stepping on the young shoot or bruising it with a cultivator is disastrous for the flowers of the ensuing year.

In blossom time, the bulb consists of the flowering bulb, the old withered bulb, and, next to the flowering stem, next year's bud, as yet only tiny — three generations in one, the past, the present, and the future.

Many plants form new tiny bulbs called bulblets along their stems or on the inner side of the scales. Each scale is as much a potential plant as a seed, for if it is separated and planted it will form a bulblet which in time grows into a bulb. Sometimes, if the bulbs are diseased or have been moved, instead of growing a new bulb within themselves their whole strength goes into forming bulblets. I have seen almost one hundred of them on one auratum, and once had a philadelphicum dissolved into myriads of tiny bulblets each growing a leaflet from its tip. All the grass-like leaves sprouting together looked as if someone had dropped a packet of seed on that spot.

With untaught eyes anyone can see and marvel at the beautiful order of the plant's life and its fascinating ways of overcoming physical obstacles, while similar happenings in our own bodies are visible only to trained scientists with microscopes and scalpels. Amongst the wonders of plant life are the ingenious devices for starting new bulblets off on a life of their own. One way is for the bulblet to grow a root which strikes out laterally and then, by contracting, pulls itself away from the parent; another is for the bulblet to grow a shoot which, as it rises, pushes it away from the bulb scale, after which it grows its own roots; or the shoot remains short and the bulblets are not pushed away, but when the bulb scale in whose axis they grew decomposes they become detached and independent.

This is how clumps and circles of young plants are formed around the parents. The youngsters each have their own roots and are quickly independent, and therefore do not weaken the parent by draining it of food. In the garden where there is plenty of space to spread out and generally, but not always, fewer enemies to attack and destroy the bulbs than in the wild, most of them survive, but in time will become weakened through being too crowded.

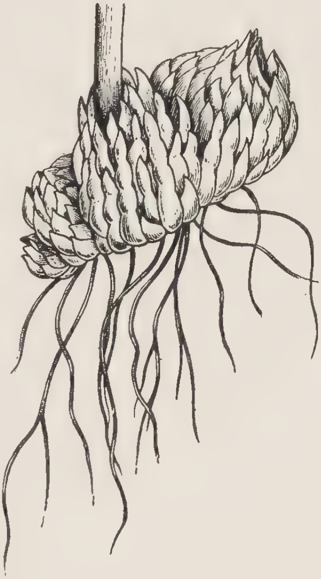
If the Lilies are to be kept in prime condition and the new offsets to be saved, the clumps should be separated every three or four years. The Lilies spend the spring or summer months above the ground busily bearing flowers and seeds and storing away energy for the cold season which they pass sleeping under the earth. Next year's bulb is absolutely dependent for its development on the strength it stores up from this year's growth. Any shock to the bulb may destroy the future bud, such as an exceptionally dry season, or when the bulb has taken a long journey improperly protected against loss of moisture, or if it has been crushed or drenched with salt water on the way. Often the bulb spends the first season in its new home without showing any growth above the ground or merely puts forth a flowerless stem. One must, therefore, not despair if there is no sign of life or a very inferior one the first year.

The young bulb is not well protected against the pests except for the dried adhering scales of last year. It seems, on the contrary, to be one of the choicest morsels for underground insects and rodents, and, like the "Pied Piper," lures swarms of them from the whole countryside. I have noticed with grim satisfaction that hansonii, humboldtii, candidum, and testaceum are not on the epicure's menu and think it is because they are bitter.

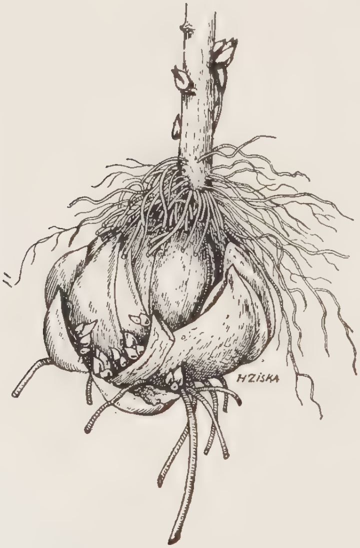
When the bulb is planted too deeply, the shoot uses up most of the reserve food, and sometimes all of it, in traveling the long distance to the earth's surface. Some of my regale bulbs have disappeared entirely from being planted too deeply. I discovered this when I dug them up to transplant them and found only an underground stem, with bulblets along it, which the Lilies had grown in a brave effort to save their lives. These bulblets were, of course, not strong enough to produce flowers before two or three seasons.

There is no hard and fast rule to relieve the gardener from the trouble of studying how deeply to plant each species any more than there are definite rules, so comforting to lean upon, of right and wrong conduct in these days of changing taboos. But as one handles them and becomes acquainted with their habits, it is not as difficult to plant them their required depth as it seems at first. The rule to plant the Lily three times the depth of its height holds with few exceptions. Of course, it would be absurd to sink a tiny bulb way down or keep a big one right near the top. Candidum and catesbaei, which produce leaves from the tips of their bulb scales, must be planted from one-half to one inch below the surface. With some exceptions, the ones with no stem roots, or very tiny ones, like a shallow couch, as do the Lilies whose bulbs form mats like pardalinum. Under the description of the Lilies at the back of the book, I have given the depth of planting for each of them.

Except for the shallow-growing species, most Lilies have some kind of stem roots; that is, roots which form along the underground stem between the bulb and the surface of the soil. Sometimes they are only fine little hairs and again they form a strong tangled mass. The stem roots help to anchor the tall-growing kinds and nourish the leaves, stem, and flower. They must be given a chance to develop to their fullest by sufficiently deep planting.


L. parryi's bulb taken from the drawing in Elwes' "Monograph of the Genus Lilium." It shows the jointed scales and the tendency to form clusters of bulbs.

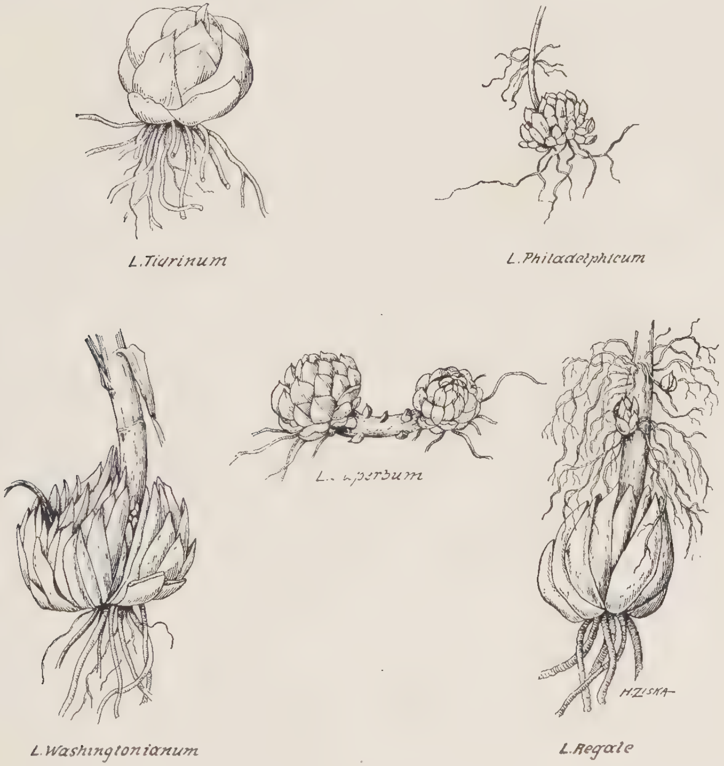
The roots growing from the under side of the bulb are called basal roots and develop more slowly than the stem roots. If they grow too slowly, the bulb may deteriorate or entirely disappear. For this reason, it is better to plant the bulbs in the fall. When we force bulbs indoors, we are told to put them in a cool, dark place for a while so that they will grow roots to nourish the plant and not send a spindly flower stalk shooting into the air which has to depend entirely upon the bulb for its food. In the garden, basal roots are formed in the cool, dark earth in fall or very early spring. Cold-storage bulbs, planted in the late spring, may flower the first year because the bud is already formed in the bulb, but if no base roots are grown they will die out. This often happens with auratums. I have dug them up after they have grown gorgeous flower stalks to find that although there were fine stem roots the bulb had vanished into the earth.



L. auratum, showing the way this Lily often behaves the first year in the garden. It forms hundreds of little bulblets and often the parent bulb dies.

A good plan, which, however, requires a heroic curbing of one's curiosity, is to pinch off the flower buds the first year and permit the bulb to devote all its strength to becoming established.

The bulbs fall into five classes or types. The first group consists of the bulbs whose scales are so tightly overlapping that they appear to be solid, fleshy globes. This class contains the very hardiest bulbs such as tigrinum and croceum. Their almost smooth surface protects them against the inroads of insects or from having water lodge in their scales and rot them. These are the kinds eaten by the

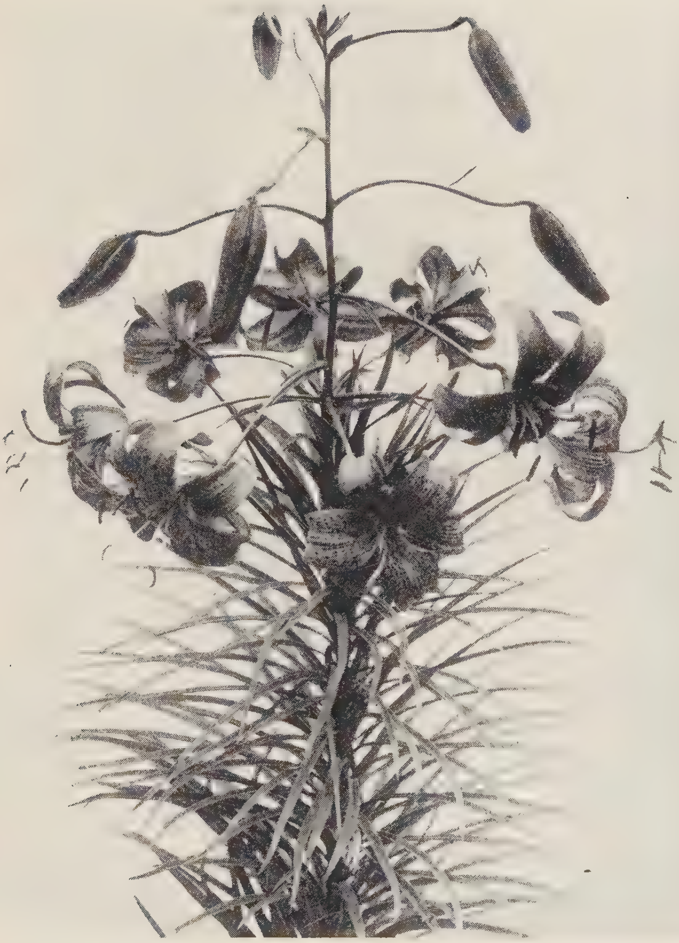


The bulbs fall into five classes: (1) tigrinum bulb with scales tightly overlapping; (2) bulb of regale with separated scales. This one shows how the bulblets form along the underground stem; (3) bulb of philadelphicum with very brittle scales loosely attached; (4) rhizomatous bulb of superbum; (5) semirhizomatous bulb of washingtonianum. This one had lost much of its natural obliqueness in my garden.

Chinese, probably because their smooth, closely overlapping scales are less likely to fall apart in cooking and they are easy to ship and handle.

The bulbs of the second class have fleshy, separated, and not closely overlapping scales, for example, sargentiae and brownii, and are on the whole less vigorous than the preceding, with some exceptions such as regale. In order to survive with this type of scales they must be placed in well-drained, gravelly, or sandy soil where the water flows away quickly and does not collect near them to damage them.

The third class of bulbs are stoloniferous bulbs. Some of them have trim, almost solid bulbs, but the characteristic which distinguishes them is that their underground stem does not rise straight from the bulb into the air as it does in other Lilies but wanders about before coming to the surface and generally bears bulblets at its nodes. The willmottiae, davuricum, and duchartrei belong to this group. The willmottiae found at an elevation of from 4000 to 8000 feet, the duchartrei at from 8000 to 11,500 feet, are both mountain Lilies, and probably developed the wandering habit from searching for food in and out of the rocks of their homes. The davuricum, however, is not a mountaineer but may come from poor, easily penetrable soil where it also has to travel about for its food. Sometimes this habit disappears in the garden, which tends to prove my theory.



L. willmottiae.

The fourth kind of bulbs are called rhizomatous and are found only on American species. They have fleshy, creeping roots along which at intervals are clusters of scales. A rhizome is a shoot which lives under the ground and develops reduced stem leaves in the form of large or small scales. It is quite thick and stores up food for the aërial shoots, and sometimes performs the function of roots. The scales on these rhizomes are often jointed. The botanists tell us that this type of root is exceedingly plastic and affected to a marked degree by light, air, and moisture, and alters its shape and growth to suit the condition where it finds itself. Although the rhizomatous Lilies generally prefer moist situations, many of them, perhaps due to their adaptable root systems, do well in the dry garden too. Pardalinum, parvum, superbum, and canadense belong to this class.

The fifth kind are also found only amongst the Western American species and are called semi-rhizomatous. They are oblique and generally have long, narrow, pointed, and jointed scales with either one, two, or even three joints. Each joint is capable of producing a new bulb if separated and planted, and this shows the redoubled effort of the Lily to insure the continuation of its kind. This type grows a new scale at the extreme end of the bulb each year from the heart of which it sends up the flowering stalk. Washingtonianum and humboldtii belong to this group. Mr. Purdy called my attention to the fact that the obliqueness disappears in gardens, another of the wild habits smoothed away under civilization. When they arrive from California, the bulbs, shaped like a house painter's brush, with the handle at one side, look as if they had been squeezed against a rock or hard clay surface, but knowing the sticky clay of their native state I do not think this explains their curious shape.

We have to study longer and further until we can understand what each characteristic of the bulb stands for. They speak very plainly now but, unfortunately, we know only a few words of their language. There are "sermons in stones and books in the running brooks," but only the wise philosopher can understand what they say.

CHAPTER V

MAY THEY INCREASE AND MULTIPLY

THERE has been a superstition slowly paling before the light of experience that Lilies do not bear true seeds. This was fostered by the fact that some of the species germinate very slowly and that the seeds of a few of them spend the first year under the ground showing no sign of life above the surface. Then some of the Lilies do not set seed to pollen of their own kind, yet do so when dusted with the pollen of other species. In a dry season certain species often do not form any pollen. All these facts do not prove that they are sterile. On the contrary many of them set seed annually which germinates quickly.

Dr. A. B. Stout says there are three types of germination: one where the seed quickly sends a leaf above the ground and a root below; one which remains under the surface the first year and forms a small bulb; and another where the seed remains in the ground but sends up a leaf.

Miss Preston of Ottawa says that the best way to raise Lilies is from seed; that is, from sexual reproduction, and I agree with her. Sexual reproduction, the botanists tell us, is where two kinds of reproductive cells fuse, the male in the pollen grain and the female in the ovule, neither of which is capable of further development unless it meets the other, but together they form the seed which carries the characters of the organism and can reproduce it.

Although the seeds of some species germinate as quickly as grass, all of them take longer to flower than other perennials. This is discouraging to those who must have everything in a hurry, even to buying their shade trees full grown and delivered at the front door instead of having the fun of helping them slowly grow to maturity.

Many Lilies if left to themselves will set seed through the help of the bees and butterflies. If there are hundreds of a kind growing together there will be no need to assist nature; but, as the average amateur usually has only a few bulbs of a variety and since the structure of the Lily is so open and simple to work, hand pollination is the surest. When the stamen is full of golden or orange pollen grains break it off from the flower and rub onto the pistil of another plant. It is safest not to use the pollen of flowers growing on the same stem for each other, as some Lilies are self-sterile.

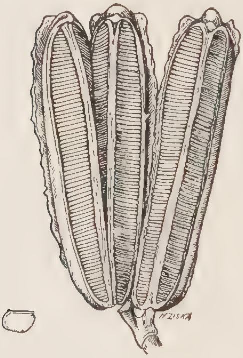
When the pistils are ready to receive the pollen they curve out and up and are covered with either a sticky fluid or with a suède-like surface. If the pollination takes, the stigma will lose its shiny stickiness or smooth velvet look and be covered with a dry, dusty film, and after the segments have fallen the seed pod stands proudly erect even on the nodding flowers. When this upstanding green pod has turned to a satiny brown and splits open at the top, the seed is ripe for harvesting. In nature, the wind rocks the stem and the seeds are slowly scattered from the pod which opens wider as they are blown off the top of the cup.

Not more than four capsules should be allowed to ripen on a plant so as not to drain its strength.

Seed capsule, split at the top and ripe for gathering the seed.

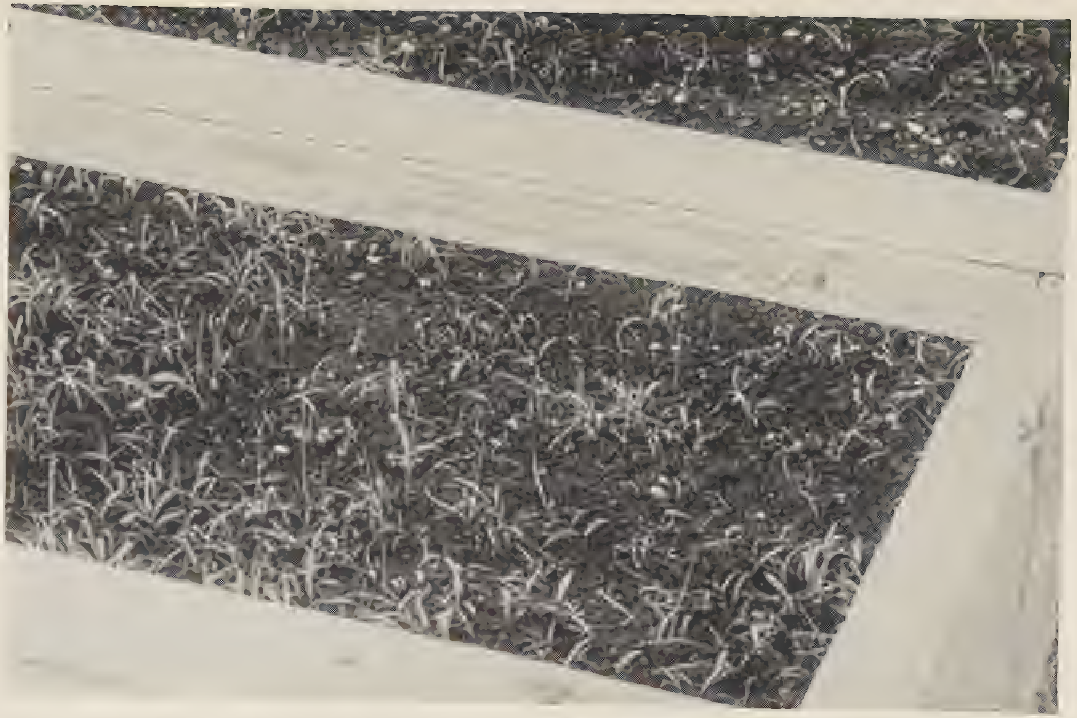
When crossing the flowers, in order to make sure of the parentage, remove the stamens from the flower bud before it opens and cover it with a waterproof, transparent bag. Open this when the flower is ready for the pollen, smear the pollen on, and cover again. Keep the bags on until the petals have fallen off. Always fasten a tag to the stem with its name, because it is difficult to remember and to recognize the Lily when the leaves and flower have fallen away and only the dried seed pod is left.

As soon as the seeds are ripe they are gathered and planted. This is usually in late September or October, when it is too late for them to send up a seed leaf that fall. Some people keep the seeds over the winter and plant them in the spring. I have tried both spring and fall planting and find there is no difference in the results, but as I follow the garden rule of doing all the work I can in the fall so as not to be too rushed in the spring, it is convenient to have the Lily seedlings off my mind and safely tucked away in their beds.



Seed capsule, showing seeds, from L. regale.

Formerly I planted the seeds in pots, but I found these tended to dry out too quickly, so I had deep wooden flats made for the seedlings which were convenient, as I could move them in and out of the shade and up to the garden when I wished to transplant a few without disturbing others. But it was difficult to keep the flats drained. Another disadvantage was that the small seeds and bulblets develop roots which direct their growing tips down toward the center of the earth and in time grow down three to five inches below where the seed germinated. In the flats I found they worked themselves down until they reached the bottom where they huddled against the boards and spread out their roots along the wood in a vain search for nourishment with a consequent retarding of their growth.



L. willmottiae, ten weeks from seed (from Mr. W. N. Craig).

Now I plant the seeds in the simplest kind of coldframes, which must, however, be *well drained*, either by having coal ashes or pebbles at the very bottom or by being situated on a slope or some other sure way of obtaining this. The ground is dug out for two feet or more when it is necessary to arrange for drainage. Then it is filled in with a mixture of two parts soil from the woods which is full of well-rotted leaf mold and one part sand. A little peat moss is forked through this and the soil is then firmed down with a board and the seeds broadcast upon it. These are watered and about one inch of the soil mixture is scattered over them and then they are watered again. If the rain uncovers them I sprinkle some more soil over them as I want them to have a half-inch-thick covering of earth. When the season is far enough along, around the end of November, the coldframes are mulched with straw, or leaves.

All the seeds which I grow, except auratum and speciosum, and sometimes henryi, are ripe before the "black frost." The pods and stems of these are picked and allowed to ripen in a cool room indoors and are then planted in the spring. In the spring the covering is removed from the fall-sown seeds and the young seedlings protected from the sun until they are well up, by slats placed across the top of the coldframes.

This is the way I raise my Lilies, but as these directions may not suit all conditions I will tell how others have grown them and, if you do not succeed by following one set of directions, try another. They are not very different, but some small detail may spell success or failure for you.

In Ottawa, where it is very cold with a heavy blanket of snow all winter, Miss Preston plants all her seeds in pots in October and keeps them in a cool greenhouse until May, when they are planted in coldframes and left until they bloom. Late in the fall a few inches of soil is added and the frame filled in with dried leaves. Seeds which have not germinated are taken back into the greenhouse for the winter. She says the heavy snow keeps them warm, but advises a mulch of leaves or straw for other growers who have not got this.

Mr. Craig, who has been very successful with his Lily seedlings at Weymouth, Massachusetts, plants his seed in April in coldframes containing soil made up of one part each of peat moss, leaf mold, and loam, with peat moss scattered on top of the bed. He broadcasts his seeds, then waters them and covers with peat moss and waters again. His seedlings are shaded for three weeks after they have germinated. He has had marvelous success from this method. The picture of his regale seedlings flowering the third summer after planting is shown here. They had been transplanted to the open field.

Lilium L. regale, twenty-six months old (from Mr. W. N. Craig).

A good soil mixture for seedlings is one-third sand, one-third leaf mold, and one-third loam.

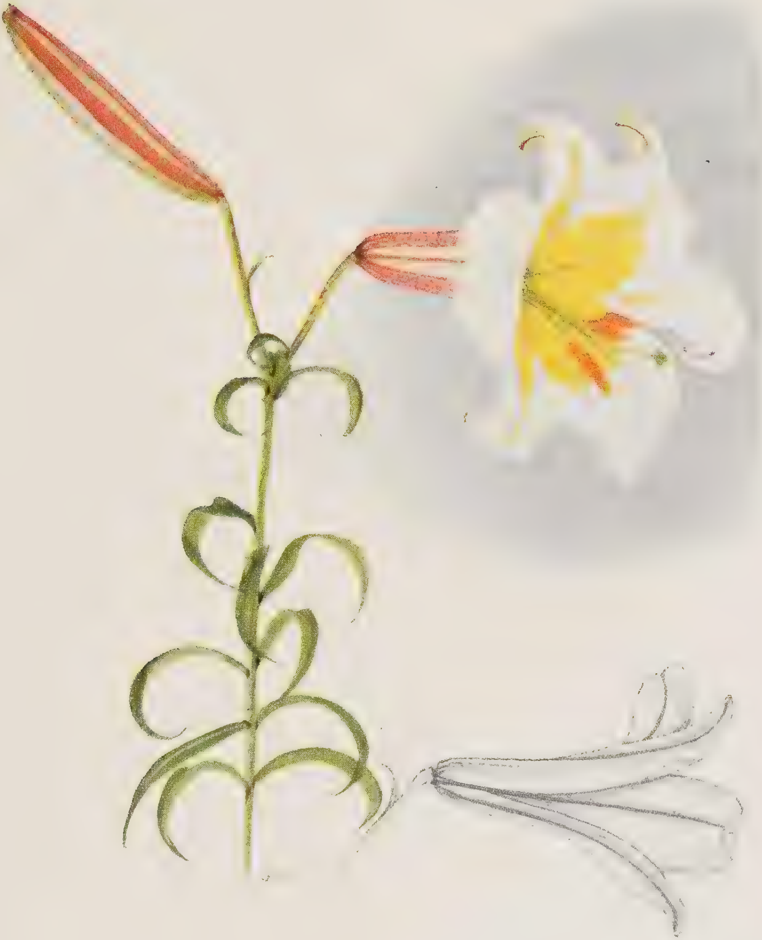
Another gardener shades his seedlings the first and sometimes the second summer. If they are grown in high, dry air they should be protected from the sun, but in the moist air of the seashore this is not as necessary.

One grower who starts his seedlings in the hothouse had a fine covering of old manure over them, because he said it made them jump so quickly in size. But his seedlings did not look as healthy to me as those grown without manure, out of doors. The stately Lily is one of the few things in this bewildered world which cannot be hurried with impunity. It takes its time, like the artist who by making his audience wait for the performance arouses their expectancy and gives them a greater thrill when he does appear.

I have grown my seeds in coldframes because I have no greenhouse and have found this very satisfactory. But in Washington and elsewhere experiments have been successfully carried out by growing longiflorum indoors and flowers were secured in seven to sixteen months after planting. As recorded in *Bulletin* 1921, by Dr. David Griffiths, longiflorum seedlings were sown out of doors, as soon as mature, in soil composed of sandy loam mixed with screenings of old dried horse manure. The seed was sown thinly and pressed down with a board and covered with a half-inch of soil and cocoanut fiber in equal parts. The bed was kept moist and sunshine and heavy rains excluded; and in from three to six weeks the seed germinated. Dr. Griffiths says that some of the strains of longiflorum can be flowered from seed in six and one-half to seven months. These were grown indoors. He secured a thousand seeds from one plant two and one-half months from pollination.

Miss Preston raised longiflorum var. formosanum and longiflorum var. giganteum from seed and wintered them in coldframes. The seeds were sown in the greenhouse in October, 1921, and in March of 1922 the young plants were potted and on June 1st transplanted to a coldframe. In September, 1922, they were repotted into five-inch pots and taken back to the greenhouse and all bloomed during the following April and May. One specimen was twenty-four inches high and had nine blossoms. Eight of them bloomed when eleven months old and the rest averaged eighteen to nineteen months from seed. The longiflorum var. formosanum lends itself better to be raised from seeds than giganteum, now called var. takesima.

Mr. C. P. Horsford has found that philippinense seeds planted in a greenhouse in the fall will flower the following summer. By sowing seeds in the green-



L. regale.

house in March he can force them to flower by fall, indoors. He has them almost ready to flower the first season and then plants them outside where they flower the second season. I think this will prove a good florist's Lily, as it is so quickly raised from seed.

For the amateur it is cheaper and more practical to grow Lilies from seed than to buy bulbs. After the seeds are planted and mulched the first winter, leave them alone until spring. Then remove the mulch when the danger from severe frost is over. Have them in a place where they will be sheltered from the burning sun. If you have no such place, cover them with slats during the hottest part of the day. See that they are kept moist but not wet. They should also be protected from too strong winds by being on the sheltered side of a building or behind a windbreak. The fall after sowing take out the strongest seedlings and transplant them into another prepared coldframe. This both thins them out and separates the vigorous from the weak. Vigorous seeds produce stronger plants which grow more quickly, give bigger plants, and bloom earlier. The seeds and propagating bulbs should be taken only from the strongest plants. Lately the demand for Lilies has been so much greater than the supply that anything in the way of a Lily bulb has been eagerly bought. The purchasers must learn to be more exacting and buy only fine, strong stock. The elimination of the weak is a virtue in the flower world.

The second summer after sowing, the strong ones may bloom and these can be moved to their permanent place. The third fall all are big enough to move to their future sphere of glory. Some Lilies will take longer to mature and flower, but in general most of them flower the third summer after planting.

Have metal or other indestructible and conspicuous labels marked with indelible ink or pencil for the seedlings. Mrs. Wilder suggests dipping the wooden labels in Valspar varnish to prevent their rotting.

Anyone can raise regales from seed. They often produce one flower the second season and always the third. They are in their prime the fifth and sixth years. In the Roger Williams Park at Providence, from six original bulbs received in 1918 there were in 1926 between 30,000 and 40,000 regale Lilies in flower, all raised from seed. Think what a future beauty is to be ours if this supremely lovely and vigorous plant can be so easily propagated and spread over the yards and parks of our country!

Some Lilies run out after a few years and a supply must constantly be grown to replace them. Amongst these are tenuifolium and willmottiae, both easily grown from seed. Tenuifolium germinates quickly and is particularly easy. In my amateur fashion I have grown twelve species from seed — auratum, canadense, croceum, varieties of davuricum, subspecies thunbergianum, candidum (not very lavishly), tenuifolium, henryi, speciosum, regale, martagon (they died after coming up), willmottiae, and concolor. There are many more which are easy to grow from seed.

Miss Preston has grown from seed longiflorum, tenuifolium, monadelphum, candidum, concolor, davidii, willmottiae, croceum, henryi, regale, auratum, speciosum (these last two she finds grow slowly), martagon, and others.

I have seen fine seedlings of philippinense in the greenhouse.

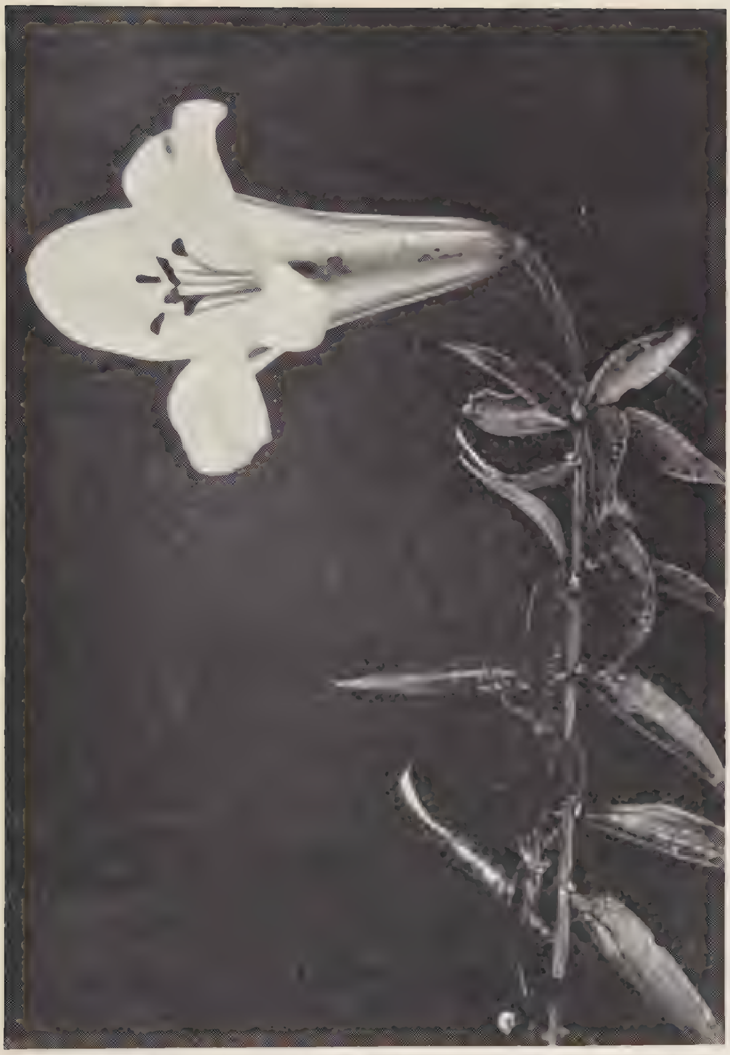
Many crosses between two different species have been effected and these are described in the tables under the Lilies involved. Other crosses have been reported between very different species such as candidum x longiflorum, with no sign of the pollen parent in the offspring of either the first or second generations. This was most likely not a cross but merely that the pollen of the candidum when smeared on the pistil of the longiflorum stimulated it to produce seed. This is called a "mechanical stimulus" and it happens on other plants as well, such as the Siberian Iris. Sometimes merely tickling the pistil with a brush may cause a plant to set seed.

Luther Burbank worked with the Western American species and got a cross from pardalinum x parryi, and crosses from many of the related Western species. Strasburger says, "The more closely allied the parent plants are the more readily, as a rule, may hybrids between them be produced."

The impression received through seeing large coldframes filled with rows and rows of blooming Lilies raised from seed makes more converts to the growing of them than all the magazine articles and books imaginable.

In Massachusetts there is a private estate which specializes in Lilies. Here regale, superbum, willmottiae, and davidii are grown from seed by the thousands and tigrinum is increased from bulbils. In northern Vermont there is a grower who has acres of Lilies grown from seeds and bulbils. He has grown leucanthum var. chloraster from seed and bulbils, willmottiae, tenuifolium, and several crosses (one between batemanniae and maximowiczii). He has also done very interesting work with the Backhouse Hybrids. I hear that in Ohio there is a grower with 100,000 regale seedlings and in the State of Washington and in Washington, D. C., they are doing fine things with seedlings. Nowhere else in the world have seedlings been grown in such numbers as they are here in America to-day.

Besides reproducing itself sexually through seeds, the plant reproduces itself vegetatively. Vegetative reproduction consists in the formation of cells or cell



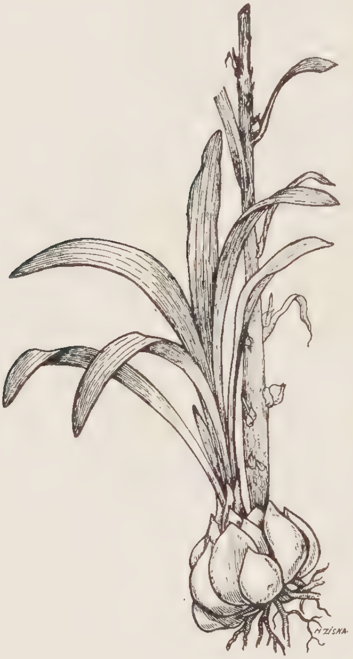
L. sargentiae at Foxden. It had just been sprayed. There are bulblets in the axils of the leaves.

bodies which, after separation from the parent plant without undergoing any further change, either germinate at once or develop into new organisms after a period of rest.

Some Lilies like tigrinum and sargentiae have tiny bulbils in the axils of the leaves along the aërial stem. These are special forms of modified bulbs and illustrate one of the clever ways in which plants overcome the vagaries of the weather or the absence of obliging insects to make sure of the continuance of their kind. After the flower has bloomed and faded the bulbils turn brown and fall off. They can be planted in coldframes which have been filled with the same soil as is advised for seeds. If laid on top of the frame they form little roots and anchor themselves in the soil and gradually the roots will pull the bulbils down. Since they are going to move down anyway, plant them one inch below the surface and cover them with the soil and keep them moist. Sometimes a tiny leaf forms at the end of the bulbil while it is still on the plant.

The plants which bear these bulbils are very easily propagated and they often flower the second season after planting. We often see a whole colony settled around a tigrinum in this fashion.

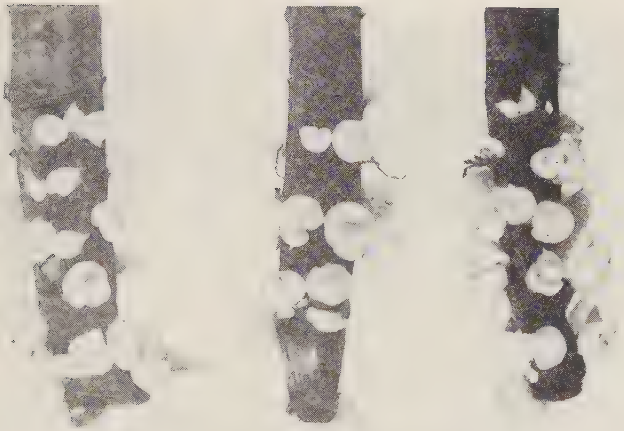
Another way of increasing the number of Lilies in the garden is by breaking off the new bulbs forming around and near the mother bulb which can be seen when the bulb is dug up. On some kinds, like speciosum and henryi, the little bulblets form along the stem just beneath the surface, and can be dislodged without disturbing the parent plant.



Bulb and old flowering stem of L. candidum, showing how the bulblets formed on the stem cut to within ten inches of the ground.

Dr. Griffiths has told of an experiment he made with candidum and testaceum. He jerked the stem from the bulb after it had finished flowering and planted it, leaves and all, sideways in the ground, and after six weeks, wherever there had been a leaf, a bulb had grown in its axil. I have not been able to accomplish this, but have found that, by cutting my candidum stem to within fifteen inches of the ground after it has flowered, the same thing happened and with less injury to the bulbs. The new leaves came up from the bulb just the same in September and I had many new candidum bulblets to plant.

Sometimes when the Western bulbs arrive from



L. testaceum stems which had been uprooted and planted and had formed bulblets in three months. (Taken by Dr. David Griffiths.)

California a scale has become dislodged and bears a leaflet at its tip, but this does not occur in all species.

One can tear off the scales from the bulbs and plant them as so many seeds just below the surface in damp sand or peeping slightly above it and within a short while one or two tiny bulblets will form on the inner side of the scale. This is the best way of increasing varieties like testaceum or other hybrids which do not come true to seed.

Mr. Purdy always tells his collectors to drop back a bulb scale into the hole from which they have dug the bulb and after a few years they come back to find the place looking just as if it had never been robbed of its Lilies.

With so many ways of increasing our wealth of Lilies we ought to have no dearth of them in our gardens. Since they are poor travelers both on land and sea let those who are able raise their own supply. For as Reginald Farrer said in "My Rock Garden": ". . . seedlings being so much more vigorous than bought plants, as from their birth they are busy adapting themselves to the place they grow in, instead of, like a poor, bought plant, making vain efforts to take up a broken strand of life and forget the place they came from."

CHAPTER VI

THEIR CARE AND FEEDING

HAVING spent an absorbing evening making out a list of Lilies from alluring descriptions in the catalogs wherein only the virtues and none of the vices are mentioned, we are wondering what kind of beds to prepare for them. No matter how they dispute about other points the authorities agree that all Lilies require good drainage above, around, and below them. Even the species which like to go wading do not thrive in still waters but prefer having it trickle over their toes. Knowing the delicate structure of the bulbs, we understand how easily they would rot if standing in stagnant water filled with injurious bacteria.

All Lilies require good drainage.

The ideal location for the Lilies is on a sloping ground in the lee of a garden wall or wing of the house or in the bays of a shrubbery border where they are sheltered from the blustering winds. Some of them prefer to grow in partial shade but none of them grow in the deep shade. A few like the hot sun on their heads and all of them must have their young shoots protected from sun and frost.

If they are planted on a level the garden should be graded to slope from one-eighth inch to one-fourth inch to a foot. If the underdrainage is not naturally sharp it should be supplied either by clay drain pipes or a foundation of gravel or small stones laid a good two feet under the garden or by trenching three feet deep.

The gravel foundation is the cheapest and easiest. Twenty-four inches of soil above the foundation is sufficient, for only a few species are planted as far down as twelve inches and their roots rarely go as deep as six inches below that.

Before making any garden it is wise to study the composition of the soil, send samples to the state experiment station, read their bulletins, and study the soil maps. If the soil is properly prepared at the beginning there is no scurrying about putting on finishing touches after the guests have come.

A soggy soil or one too heavy to allow the stems to move freely through it, or one of a clayey, sticky consistency prone to bake on a summer's day, must be lightened by adding sand, gravel, coal ashes, or decayed leaf mold, whichever of these ingredients is convenient and at the same time the most effective for improving the particular type of soil.

If, however, the soil is too light and sandy to hold moisture, it can be made more fibrous and spongy by adding and incorporating into the soil any of the following ingredients: well-rotted oak leaves (they are good for all deficiencies); a compost of rotted plants; peat; broken-up sod; well-rotted manure of cow or horse dung. The piles of compost and rotted leaves constitute the gardener's riches, the capital from which he draws to invest in his garden, and the bigger the investment the greater the returns will be.

The compost is made by heaping together weeds and all the clean garden refuse, grass cuttings (from edgings not from the lawn), and clean kitchen waste such as the outside leaves of the lettuce, beet tops which are too tough to eat, potato peels, and celery tops. Lime is sprinkled on it to hurry along its decomposition and topsoil scattered over it and it is turned about three times a year. In two years it makes a crumbly brown substance almost entirely composed of humus — another word for decayed vegetable matter. The lime in the compost has not hurt the Lilies as far as I can see.

The old leaves are kept in an open hole and turned as often as the gardener can be cajoled to give the time to it. The two are kept apart, as they are used for different purposes. The first is used anywhere where humus is needed, the other reserved exclusively for the Lilies.

The leaves of the oaks are tougher and slower to rot and more acid than those of the maples. Leaf mold, like kindly old people, sweetens with age.

L. tigrinum in the border.

Fresh leaf mold is acid and fine for the seedlings which mature quicker in slightly acid soil. Decayed leaf mold increases the humus content and lightens the soil and is the very best food for the Lilies.

If we did not already have far too many laws there ought to be one enacted imposing a fine on everyone who burns the sweet-smelling piles of dried leaves, for he is destroying a precious commodity. However, we have not yet reached the stage where wasters will be punished as well as idlers.

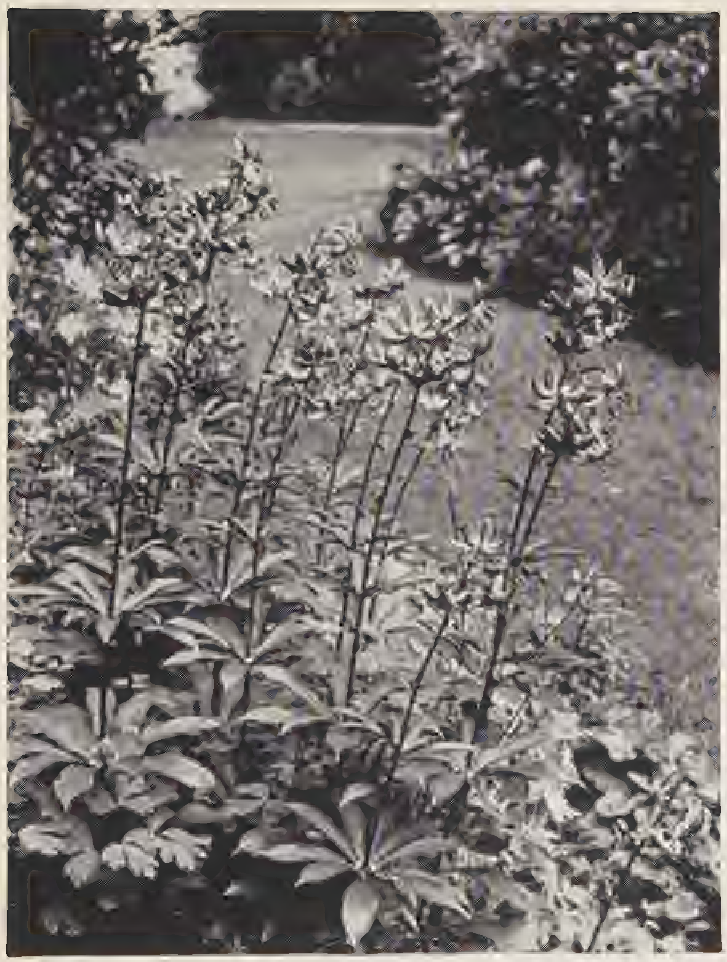
There is another point about which all growers agree; namely, that *well-rotted manure is good for the Lilies*. All fertilizer is manure, but when we say "manure" we usually mean animal dung mixed with straw bedding. This does no harm if scattered on top of the beds, but it is more efficacious when laid in as a foundation under the soil. Fresh manure is harmful because it heats the ground and forces the plants up too early. If scattered on top of the beds, being full of weed seeds, it leaves a crop of them behind to mark its path. If it is near the bulbs under the ground it rots them. Too rich a soil is not desirable, although it is claimed that rich beds give bigger plants and larger and more flowers to the stalk. We have known for a long time about the evils of overfeeding ourselves and that most of our ills came from overeating, but only lately has it been realized that the same is true for the plants.

Chemical fertilizers are not recommended for Lilies except under special conditions and with expert kandling. Nitrate of soda is said to be particularly bad for them. Bone meal is the one exception to this, because it dissolves slowly and should be applied very early in the spring when feeding from above is imperative.

Stuffing too many ingredients into the soil interferes with the normal chemical and physical reactions and may either deaden or overstimulate the development of the bacteria necessary to the growth of the plants. The science of ecology tells us that certain plants must be associated with each other because one kind will bring bacteria or nodules which are necessary to the growth of the other. The right association of plants which will one day be a helpful factor in growing them has not yet been worked out for the Lilies, nor indeed for many families, and is still in the realm of speculation.

If the soil becomes abnormal through the preponderance of any one element or through the presence of too many foreign elements, the outer surfaces of the roots and bulbs may be injured and the way opened for diseases to enter in and pillage, leaving destruction in their wake. So it is wisest not to doctor the soil too much with foods and chemicals.

Reams have been written about whether the lime-



L. hansonii in the borders at Breeze Hill.

hating Lilies will sicken in acid soil and the peat lovers in an alkaline one. I am inclined to think the presence or absence of lime is not an important factor in the health of our heroine. *On the whole, Lilies thrive in neutral soil.*

The soil in my garden and in the gardens of two big growers when examined were found to be neutral; that is, neither too acid nor alkaline. Canadense and philadelphicum grow wild in acid soil but canadense grows taller and bears more flowers to the stalk in the neutral soil of the garden. In my garden, canadense grew lustily for four years and during the fifth became diseased. In the acid soil of a nurseryman who grows thousands of native plants from seed and sells a good many canadense, these were quite diseased and he told me they always were. In cultivation they seem to thrive or sicken in sweet soil and sicken in acid soil. Obviously the acidity or non-acidity is not the cause. This does not prove anything for all Lilies, but does for one typical acid-soil species. Philadelphicum, another Lily, which grows wild in acid soil, does not thrive for me, but I think it is because my garden is not dry enough.

Often the Lilies have not sought the undesirable acid-soil pockets where we find them from choice, but have been thrust in them by the more vigorous, unmannerly weeds. When these species are brought into the neutral soil of the garden they relish their deliverance from forced poverty and immediately adapt themselves to the new affluence.

Since the question of whether some Lilies detest lime or not is still a mooted one until we know more about it, we had better keep the soil sweet without it. With our piles of leaf mold, compost, and well-rotted manure we are independently rich and can ignore the artificial fertilizers altogether.

Several growers have told me how they prepared their soil. Hoping that from amongst the different ways of solving the problem the reader will find one corresponding to his own, I am presenting them here. The general principles are the same, but as each garden has some idiosyncrasy which needs a special treatment, they cannot all be handled alike.

Mr. Fray, a commercial grower of the Pacific coast in Granite Falls, Washington, grows his Lilies in beds by themselves. His soil is deficient in phosphates and potash which are washed out during the heavy five months' rainfall, so he supplies them in the form of a complete commercial fertilizer. He digs out his soil to a depth of eighteen inches and adds to two parts of this one part each of well-rotted manure and leaf mold or instead of leaf mold grassy sod or compost. To each barrowful of soil he adds two quarts of bone meal and a handful each of sulphate of potash and super-phosphate and mixes it all well and fills the beds to within nine inches of the

L. regale growing at the Roger Williams Park, Providence, Rhode Island.

top. This he presses down and covers with one inch of river sand and then sets the bulbs on it from six inches to nine inches apart, depending upon variety. Then he covers the bulbs thoroughly with sand for an inch or so and fills in with the same mixture of soil for about two inches to three inches above the level of the ground. He varies the depth of planting according to his species. He says the Lilies bloom for four or five years in beds so prepared, but then the soil will be exhausted and so full of offsets that they will require lifting and transplanting.

Miss Preston at Ottawa grows her Lilies in soil which is almost pure sand to which farmyard manure has been added from time to time, but where no special preparation has been made for the Lilies. She says they require good garden soil well dug to a depth of twelve to eighteen inches.

In the Roger Williams Park at Providence, Rhode Island, where the regale and other Lilies are grown to perfection, the soil is prepared by being dug two feet deep. The bottom of the bed is then filled in for six inches with well-rotted manure and on top of this loam is put to the level of the ground. The soil there is quite sandy.

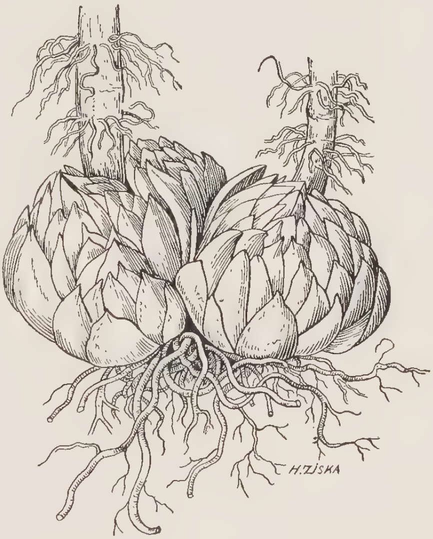
In a garden in Massachusetts where the Lilies grow as profusely as Petunias or Sweet Alyssum do for me, they are fed leaf mold and bone meal and no lime.

On my place, the garden, given over solely to her majesty the Lily and her lowly retainers, is on a well-drained slope and has a clay foundation. It is dug to a depth of twenty-four inches and all the soil lifted out and to one part of my soil is added one part of leaf mold, if I have it, or, as a second choice, compost (made as described above) and a little sand. This is all well mixed together. The bottom is filled in with broken-up sod and on top of this comes the soil mixture put back into the bed to a slightly greater height to allow for settling. If the soil is very poor I substitute topsoil. Holes are dug for each Lily one or two inches deeper than required and clean, fine sand is dropped into them, and the bulb inserted and surrounded with sand and the rest filled in a little above the level with the same mixture of soil. The bulb is surrounded with sand for drainage and prophylaxis, for no organisms can live in the sterile sand to reach the bulb from the soil. Plant the big bulbs about eight or ten inches apart and the small ones six inches apart, and all three times the depth of their height, with a few exceptions.

In the flower garden where the Lilies have to share their realm with other flowers, sand is not mixed into this soil on account of the perennials. The hole for the Lily bulbs is again dug two inches deeper than is required and filled in with fine sand, and the bulb is placed on this, covered with sand,

and the hole filled in with soil to a little above the level of the ground. Planting the bulbs on their sides late in the fall only keeps the water from settling in their centers during the first winter, for as soon as the roots grow out they will straighten the bulb.

That Lilies like the same kind of soil in which potatoes flourish is proven by the story about a farmer who plowed up a meadow full of wild Lilies to prepare it for planting potatoes. This separated the rhizomes and stimulated them to grow vigorously, so that when he came to cultivate his fields later in the summer he found hosts of golden Lilies nodding to him from amongst his vegetables. If we set out to intercrop our potatoes with Lilies I fear no such success would be ours, but it is worth trying, for just think how soothing to the spirit it would be to rest our eyes on lovely Lilies when we straighten our backs aching from hoeing potatoes.



Bulb of L. hansonii, showing how the bulbs double up in the garden.

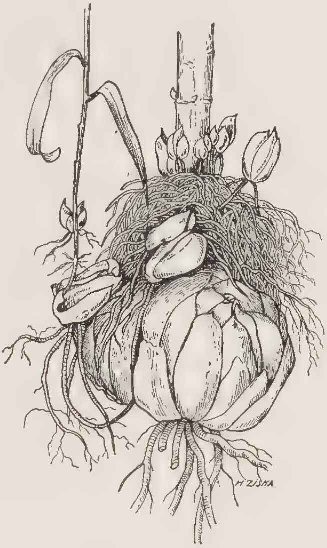
Lilies thrive in good average garden soil fertilized with well-rotted manure, rotted compost, or, best of all, rotted leaf mold.

The beds in the garden are made over from every three to five years, according to how many young Lily stems are growing up next to the parents. This performance takes place preferably on a cloudy, cool September day. The Lilies and other plants are gently lifted and placed on planks which have been laid along the garden path and shaded with newspapers which are used for all sorts of purposes not intended by the editors. We remove the soil for quite a distance away from the stems before lifting up the Lily to prevent accidentally piercing its heart with the trowel. As large a portion of the border as can be finished in one day is dug up, so that the plants will be out of the ground only a short while. After they are all removed the soil is treated exactly as it was when first prepared.

Next year I will follow the English system of trenching and take the soil from the first part and wheel it to the end of the border and fill in with soil brought from the vegetable garden, and the next piece will be filled with soil from the end of the border, the third from the next to the end and so on, leaving one portion of soil over to return to the hole in the vegetable garden.

The perennials are put back after having been divided or moved to form new pictures. The Lilies, too, are divided if they have doubled and the offsets removed and all are planted again in fresh, clean sand. This keeps the beds sweet and fertile without the use of chemicals.

Although it sounds tedious it is great fun, for all day long I am painting imaginary pictures lovelier than the reality with its pests and frosts ever is, and when the gardener goes to his lunch, being too grimy for the formalities of the dining room, I have mine in the garden, all the while inhaling the delicious smell of the freshly turned earth, gloating over the fecundity of my plants, and planning new borders to take care of their offspring.



L. elegans, davuricum subspecies thunbergianum (candlestick Lily), showing increase of bulblets in and through the stem roots of this Lily.

I clean up my beds late in November when there are no distracting and adorable little plant babies calling me away from my work to watch and admire them breaking through the earth. The late weeding makes it possible to postpone the spring cleaning until the shoots are well above the ground, for the tips about which are curled the leaves and flower bud of the coming season are very tender and easily broken off and more of them are injured during the early cultivating and the removal of the winter covering than in any other way. When the shoots are just below the surface, a heavy-footed person tramping down the earth above their heads often cripples them. They are best left severely alone until the sleepiest Lily has risen well up out of its winter couch.

Though the gardener is impatient to begin on the color combinations he has been planning all winter, he must not impetuously slice into the soil to plant his annuals and biennials. If he is a tidy soul it will require a Puritan self-control to keep out of the flower beds until June, but he will be well repaid by the exercise of this almost obsolete virtue.

Sometimes, not being a Puritan, I just cannot resist stepping into my beds to pull out a weed or fill in a space, and as the Lilies are scattered all through the borders I am invariably punished by finding to my horror that I have murdered some future beauty in the cradle. But swift punishments which fit the crime have brought about a conversion and I seldom sin now; that is, as the Captain in *Pinafore* said, "Hardly ever."

The ground about the Lilies should be kept moist during the growing season while this year's stem leaves and flowers and next year's buds are developing, but after they have flowered they go into a resting period and should be left alone and not stimulated to future growth.

Those growing in the vegetable garden or other places where appearances are not of prime importance are mulched with peat moss or hay to keep them damp all summer.

During the dry spells which occur in June and July (in our part of the world), all of them should be watered, but if there is a drought in August only the late-blooming ones still need moisture. They usually do not tell us they are thirsty by drooping or fading, and their Spartan behavior gives no inkling of their suffering. If they suffer from lack of water the bulb is called upon to supply the deficiency, with the result that inferior flowers are produced the following year. So keeping them moist as long as they are growing not only helps this year's but next year's bloom as well. Where we live it is very windy and once after several days' buffeting some of the Lilies had crooked necks. I was horribly afraid they were sick, but found that all they needed was a good soaking with the hose. This was done by letting the hose dribble water on the Lily bed for half a day.

A lawn sprinkler playing on them for three hours late in the afternoon will thoroughly soak the ground.

I water mine this way two or three times a week, but on sandy soil they have to be watered every day. I bless the man who invented the "Water fan" which sprays sixty feet at a time and so does my family, who quite justifiably resented my Lilies in the days of the hose. For not only did I destroy the calm and festive dignity of the dinner hour by coming to the table in soggy clothes spattered with mud, but made a sustained conversation impossible by jumping up every twenty minutes to move the hose along.

The next morning after watering, before the sun has had time to bake the soil, it should be stirred to make a dust mulch and conserve the moisture in the ground.

All Lilies except that husky peasant the tigrinum require mulching in winter. This should not be put on until after the ground has frozen hard to prevent the mice from spending the winter under its grateful warmth. The mulch keeps a layer of air between the earth and the outer air, which regulates the temperature and prevents the ground from cooling or heating too quickly. In the winter one part of my garden is buried under a sheet of ice and the mulch even keeps a layer of air under this too. The layer of air protects the young shoot from being lured out too early by the first warm days of spring and keeps off the chilling winds which often reappear long after the time for them is past. The mulch should not be removed in spring until all danger from the alternate thawing and freezing is over. This is the gardener's dragon, and once he has ridden past the monster with its death-dealing breath blowing first hot then cold all will go well with him.

Newly fallen leaves do not make a good mulch, as they flatten out and pack as soon as they become wet and so form an air-tight covering over the beds. Rotted leaf mold makes the best mulch, because it can be left on all the year round and a little of it worked in at each cultivation. Salt hay is good and so are rye and oat straw if they have been thoroughly winnowed by machine and are entirely free of seeds, which otherwise sow a persistent crop of hay in the garden. The straw can be bought at the feed store if there is none on the place. I once used buckwheat straw and spent the following summer pulling out young buckwheat plantlets which kept on coming in a never-ending succession. The mulch should be only three or four inches deep and cornstalks or boughs scattered lightly on it to hold it down.

When it begins to get warm in the spring remove the cornstalks or boughs first; and a week or so later, when all danger from frost is over, gently and gingerly and without stepping into the beds take off the straw with a pitchfork and not a rake. For by now the young shoots will be either announcing their imminent arrival by cracking the soil or lifting off their lid of earth, and a few precocious ones like candidum, hansonii, henryi, and martagon will be ten inches above the ground. Under the light mulch of straw the stalks do not become yellow from lack of air as they do under a heavier covering.

Now that the beds are ready, when shall we plant the bulbs? Up to the present there has been no choice and we were in the same predicament as the man who, after a long scrutiny of the menu, ordered his favorite dish only to be told, "You can have only ham and eggs." The bulbs are shipped as soon as they are ripe from far-away countries with such varying climates as Japan, Holland, France, or our own Pacific coast. There is a steady procession of arriving guests from September when the candidums come in from northern France way into December when the latest Japanese bulbs to ripen, the auratums and speciosums, reach us after their long journey.

However in time all of the Lilies will be procurable under the label of "home grown" and will have to travel only a short distance after they are ripe. A few of the growers now try them out for a year on their own grounds before selling them, an admirable practice to insure the sale of healthy bulbs.

Every plant receives a shock when it is moved, but the dormant bulb with its reserve of food can stand more than others. When the stem above the ground has died down is the best time to take up the Lilies to be moved, for they will have ripened next year's bud. They must be carefully lifted from the soil, like the precious bits they are, so as not to break off the scales.

The stems of the late-blooming species die down after the earlier ones, so they do not all ripen conveniently together to be shipped neatly done up in paper bags like the tidy Tulips. The Lilies are usually shipped in wooden boxes and packed variously either in peat moss, shavings, sphagnum moss, or clay. The Western Americans are packed in sphagnum or green moss so they will not dry out, and the Japanese use clay as a packing material.

Regale, the Hebe-like beauty, can be lifted equally well in spring or fall if it is only for half an hour's trip and the roots will not have a chance to dry out. Philadelphicum is best uprooted when in flower, and the moving day for candidum is usually at the end of August when the stalk has died down before the basal leaves come up. When these are ripe they are a yellowish white. I once saw a shipment which had been dug too early and they were greenish in color. In fact any of the hardy ones can be moved with impunity at almost any time if they are merely to be taken from one part of the garden to another and will be out of the ground only a short time.

As really happened once upon a time not so long ago: A wealthy lady, who is a flower connoisseur, planned to have her daughter married in June in the garden. She realized that the red and pink Phloxes and Roses were more suitable to the gay chatter of a garden party than for the silent solemnity of a marriage, but as she was very busy she did not dwell on it much until a week before the wedding when she suddenly thought how lovely it would be to have her daughter's bridal procession pass through an aisle of snowy candidum Lilies. So she rubbed her lantern and commanded the jin who instantly appeared — they sometimes do, you know — to fill her garden with flowering Lilies. He obeyed and brought hundreds of blooming candidums on barges covered with tarpaulins from his nursery. These were planted in the garden and the bride was married amid the gleaming, fragrant blossoms.

In anticipation of the late comers, which arrive after the ground is half or altogether frozen and soggy from the nightly frost, I dig a hole while the ground is still soft and cover it with leaves or straw to keep it from freezing. The soil and sand to fill up the holes are kept in pails in the cellar. But it is very hard on the travel-weary and weakened bulbs to thrust them into the cold, damp ground, and it is preferable to winter those indoors which arrive too late to make a root growth that fall.

At first I wintered the late arrivals in pots in the coldframe and they did not stand this at all. Then I planted them in boxes with holes in the bottom and stood them on ashes in a well-drained coldframe and covered them with leaves over the winter. But evidently this did not suit them any better. Healthy bulbs at the beginning of the winter showed signs of green mold and soft rot when they were lifted out in the spring. In boxes alongside of those which had sickened I took out perfectly healthy bulbs, perhaps proving that some species can stand wintering this way and others cannot. Whatever the explanation may be I have lost so many this way that I was beginning to despair of ever carrying them through the winter when Dr. David Griffiths came to my rescue and told me what to do. He wrote me that he handles his late arrivals as follows: "My preference is to pot the bulbs arriving after December 1st (this is for Washington, D. C. I would say November 1st for Peekskill) in quite dry earth and store the pots at a temperature of from 38° to 45° or 50° until spring. A root cellar would be a good place and the pots can be buried in dry sand. In early spring set the pots outside and cover with débris until growth starts. Later plant the ball of earth in permanent quarters without disturbing the bulbs." This seems a sensible way of handling the bulbs and one I heartily recommend. It enables the late comer to grow basal roots very early in the spring. I have seen bulbs handled this way at the Boyce Thompson Institute come through beautifully while others from the same shipment died when buried in coldframes at my place. I have given the wrong method in detail to prevent others from making the same mistakes.

Few of us, even if we wish to, can give up the space to gardens devoted to one flower only as they do on park-like English estates where one strolls from the Rose and topiary gardens through the rock garden and on to the woodland filled with flowers. If we have a garden for vegetables and one for perennials and a shrubbery or Rose garden, we are doing very well and have more than an owner and his gardener can manage.

Most of us want our Lilies in the flower border or not at all and there is no reason why they should not thrive there as well as thousands of other domesticated wild plants.

Lilies take up very little room and improve the borders by giving height and accent, but they cannot be dumped anywhere indiscriminately. Most of them require sunshine on the upper portion of their stems and flowers, but like to have the lower portion shaded, and none of them can stand crowding. They are also a bit snobbish about their associates and should not be closer than four feet to the pushing perennials such as Phlox paniculata, Peonies, Hemerocallis, Hollyhocks, Heleniums, and others whose habit it is to settle down stolidly in the border sending out sturdy roots which brush aside the tenuous Lilies. Although we cannot have anything worth while in this world without some sacrifice, in this case we do not have to renounce these sturdy plants altogether, but merely to move them to another place.

There are many lovely flowers which do well planted with Lilies, especially those whose low and spreading foliage protects the shoots from the last frost after the mulch is removed and during the summer keeps the ground cool and moist. For with very few exceptions the narrow Lily leaves cling closely to the stem, rising straight up into the air and do not shade the ground at all. Low planting about the base of the stems softens the stiffness of the perpendicular stalks with wavy, horizontal masses. Perennials which go well with them, just to mention a few, are Aquilegias, all the Rues, Iris, Pentstemon, Coreopsis, Iceland Poppies, Anemones (the kinds which thrive in open borders), Sedum spectabile and Sedum acre, Thermopsis and Heuchera; those with blue flowers or blue varieties such as Lupine, pink white and purple too, Anchusa (not too close), Flax, Plumbago larpentae, blue Funkia (the white is too strong), all the Campanulas in all shades, and for purple, the New England Asters which should be grown four or five feet back of the Lilies and bent forward to mingle with the speciosums. Ferns are good ground covers for the shade-loving Lilies and so is Pachysandra.

Blue flowers go very well with the yellow Lilies, for they form a complementary color scheme and not only the paler tones should be used but those further up and down the spectrum, including violet at one end and orange and red at the other.

The early biennials which flower before them are not planted with the Lilies, whose beauty is augmented if they rise from a harmoniously colored carpet furnished by such lowly companions as Forget-me-nots, Pansies, Violas, Scotch Pinks, Chinese Delphiniums (which I treat as biennials), and Campanula media.

Cheery drifts of annuals are the most effective foils for the slender Lilies and also form a colorful carpet. I think annuals are the handsomest associates for the Lilies, but unless they are sown in the fall they should not be planted out in the spring until the Lily stems are well above the ground and then only the low-foliage ones which will form a summer mulch and not the scraggly, naked-stemmed ones should be chosen. Of the blue ones, there are blue Salvia, Cornflowers, Lupines (purple and pink too), Nigella (white too), Larkspur (purple and white too), and Ageratum and for other colors Hunnemania, Eschscholtzia, Petunias (the purple ones are gorgeous, but the white and pink too), Calliopsis, Asters (the single ones), Iberis umbellata, Sweet Alyssum (the white, cream, and lavender kinds), and Cynoglossum amabile. Blue Ipomœa is a lovely annual vine to grow near them, and although I have not tried them I think Nasturtiums and buff-colored Phlox drummondi ought to go well under brownii and sargentiae, and last and best and most important, Heliotrope, and yet more Heliotrope.

Many authorities to the contrary, I do not think Lilies do well amongst shrubs, for they are not strong enough to survive near their hungry roots except for superbum, which I have seen fifteen feet high with an incredible number of flowers growing right from the heart of a bush. Deciduous shrubs are out of the question unless they are used as a background and far enough away from the Lilies not to rob them of their food. Many of the evergreens do not send out lateral roots, but have a taproot growing toward the center of the earth, which makes them admirable subjects to plant amongst the flowers and especially the Lilies. These are Arborvitae, Retinospora, Junipers, Cedars, and Hemlocks if clipped and kept low. Small-growing shrubs like Andromedas and Daphnes are good with the Lilies, although my garden is not acid enough for the last.

The aristocratic Lilies do not look well in plebeian crowds, but are at their best when three or five of a kind are grouped together against a dark backdrop. Planting schemes for them should be arranged with utmost restraint, for if they are jammed into a riotous border, their stately beauty is lost like the rarest of antiques when piled on top of each other ready for the auctioneer. All pictures need frames to shut them off from the outside world and to concentrate attention upon them, and besides frames, the flowers must have backgrounds to throw their lines into relief and soften the hard shadows.

Walls of gray field stone or rosy brick make flattering backgrounds. At Bagatelle, in the Bois de Boulogne, there is an enchanting small garden designed by Monsieur Forestier inclosed by a tall yew hedge forming a line on the ground like a castellated tower in the bays of which are clumps of candidum Lilies. The snowy Lilies against the almost black hedge are a frame surrounding the central beds filled with violet, purple, and blue Japanese Iris.

There are four scenes with the Lily cast for the leading rôle which I will describe. One took place the middle of June in my own garden, where against the field stone walls clumps of yellow-flowered hansonii and white martagons with feathery Meadow-Rue scattered through them lifted their stems from a carpet of purple Violas and blue Forget-me-nots, while behind the wall a dark Pine tree gave the benediction.

L. candidum at Foxden, against the gray stone wall along the top of which is an American Pillar Rose.

Another scene was laid in a Massachusetts garden also in June. The steps from the house descended onto a terrace carpeted with a well-groomed lawn. Along one side of this ran a pergola covered with leafy euonymus, and all along the other side was a border filled its whole length with gold and rosy-throated regales rising from billows of Heliotrope, which now and then cast up in a higher wave of purple, carrying the color up to the flowers in the standard Heliotropes. Over the balustrade back of this white, rose, and purple surf, a pinkish yellow Honeysuckle (Lonicera heckrotti) twisted itself. Whenever I am depressed I summon this picture to my mind to gladden me.

In the first week in July I saw Lilies growing according to all the rules of the Lily books which, however, is not a good way to grow the sun-loving kinds. The garden was in an open woodland through which wound a stream with steeply sloping banks. There was a ground cover of low wildings. The red and yellow flowers glowed from amidst the flickering shade of the leafy background. The American species predominated and all the martagon-flowered ones seemed to be out the day of my visit, swinging similarly nodding heads in unison.

A fourth scene took place early in September in a garden built in the ell of a gray stone house. All through the neatly box-edged beds swayed the fragrant pink speciosum Lilies, and, keeping them company, were drifts of Anemone hupehensis, Heliotrope, and blue Funkia, and in the corners of the garden to give balance and accent were clumps of spire-like creamy Artemisia. It was one of those rare moments which sometimes happen, in spite of drought and disease, to hearten the rest of us to keep on trying.

Although the combination of Madonna Lilies and Delphinium is almost as hackneyed as Chopin's Minute waltz, repetition has not lessened the beauty of either. Purple Canterbury-Bells and orange croceum Lilies added to the pallid white and blue bring a wider range of tone to the garden song. I like pink Roses and purple Clematis dripping over the wall behind them and green-foliage plants rippling at their feet.

André Vera in his book, "Le Nouveau Jardin," says that in these days of small gardens where we have to express ourselves in limited spaces we should have superimposed color schemes; low plants to form the color base and then higher ones rising from these in a second color tone and still higher ones in a third. I tried out the idea and had a two-color scheme beginning with a base of purple Petunias from which rose bright orange croceum Lilies and it was a grand success. Purple Violas and blue Forget-me-nots intermingled would make a becoming base for the croceums and so would blue and yellow Violas; and Ageratum is always good either alone or with purple.

Shade-loving Lilies are charming in the fluttering light of a scanty wood through which winds a stream. However, they should not be planted just under the circumference of the branches but either farther out or deeper under because the tips of the feeding roots extend as far out under the ground as the branches do in the air. In a southern California garden, where they need more shade than we do in the more northerly cooler places, I saw them clustered close to a palm tree whose roots are very deep.

Lilies, like all beauties, are fastidious, but if their demands are granted and they are handled to their taste, they will reward the grower by giving generously of their charming selves.

CHAPTER VII

*DISEASES, PESTS, AND HOW TO FIGHT THEM**

IT is unpleasant to conjure up visions of sickly plants withering on their stems, yet we have to know about the ills and diseases of flowers in order to fight them, for a lurking enemy is much more dangerous than one standing in the open. The Lily's foes are still safely hidden behind a smoke screen and very little has been done to blow it away.

Some Lilies seem to be inherently weak and subject to disease while others have a hardy constitution and always keep well.

We read that very large bulbs are likely to become diseased. They are forced to their huge size in Japan where they are sold by the weight, and this forcing is said to weaken them. One experienced grower maintains that big bulbs do as well for him as the smaller ones, and I agree with him. So here is a subject for careful checking up.

Sick bulbs should never be planted amongst the healthy ones. If they arrive suffering from any

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* In preparing this chapter Dr. Orton and Mr. Guterman of the Boyce Thompson Institute for Plant Research have very kindly helped me. They told me about the diseases, their popular and scientific names, and their life histories, and have in addition been so kind as to go over the chapter critically.

L. brownii at Foxden, which had been sprayed just before it had its picture taken.

disease, it will not be long before they are acting as hosts to other bad company and so become a two-fold menace.

It is a good plan to plant the bulbs suffering from bulb rot or other bulb diseases in a special place off by themselves and keep them in this hospital until they recover and then move them up to the borders. Those which do not pull through after a season or two should be destroyed. In fact the safest way is not to put any bulb in the flower garden until it has passed one season in an isolation ward, to see if it is healthy. When buying imported bulbs only order a few at a time so as not to fill the garden with diseased bulbs, with the exception of candidums, which when bought from reliable dealers are quite safe.

Often the bulbs arrive so sick that they show outward signs of their distress and have begun to rot and smell badly. But once in a while their appearances are deceptive and healthy-appearing bulbs carry the germs of diseases in them which only develop the following spring.

I have had a good deal of trouble resulting from wintering the late arrivals improperly and have described at length how to treat them in the chapter entitled "Their Care and Feeding." Evidently others have found the first winter a difficult one too, for I read the other day that one grower in order to make sure of his newly imported bulbs breaks off the bulb scales and plants them separately so they will generate bulblets. This is a very good idea if one is willing to wait patiently for the Lilies to flower.

The soft rot on the bulbs is a bacterial disease similar to the disease of the Calla Lily caused by *Bacillus aroideae.* The green mold which sometimes occurs on the bulbs is a *Penicillium.* This last has appeared infrequently on newly arrived bulbs and on those which have spent an uncomfortable first winter out of the ground.

The *Penicillium* is a saprophyte (a plant which lives on dead organic matter) or at best a very weak parasite and is usually troublesome only when the bulbs are in storage or have been injured.

The way to cure the soft rot, if it is not very serious, is to cut it out and soak the bulbs for one or one and a half hours in a solution of an organic mercuric compound. I have tried it and found it cured the bulbs sick with soft rot and with green mold. There are several of these organic mercuric compounds on the market and the directions for using them are on the boxes.

If the bulbs have a bad case and a large portion has been affected by the "soft rot," the best way to handle them is as Dr. Griffiths of the Bureau of Plant Industry at Washington has done. He cuts off bits of the scales and plants them. He sent me some pieces of candidum scales which had been cut off from a bulb, as he said, "about as rotten as they ever get" in April, which is a bad time of the year to start propagating. These were put in sand and by the end of June they had given birth to nice plump little bulblets and the pieces of scales were white and healthy.

Like the Greeks of old, the bulbs are given a welcoming bath upon their arrival. This consists of a mercuric colloidal compound, a commercial preparation and is a virulent poison.

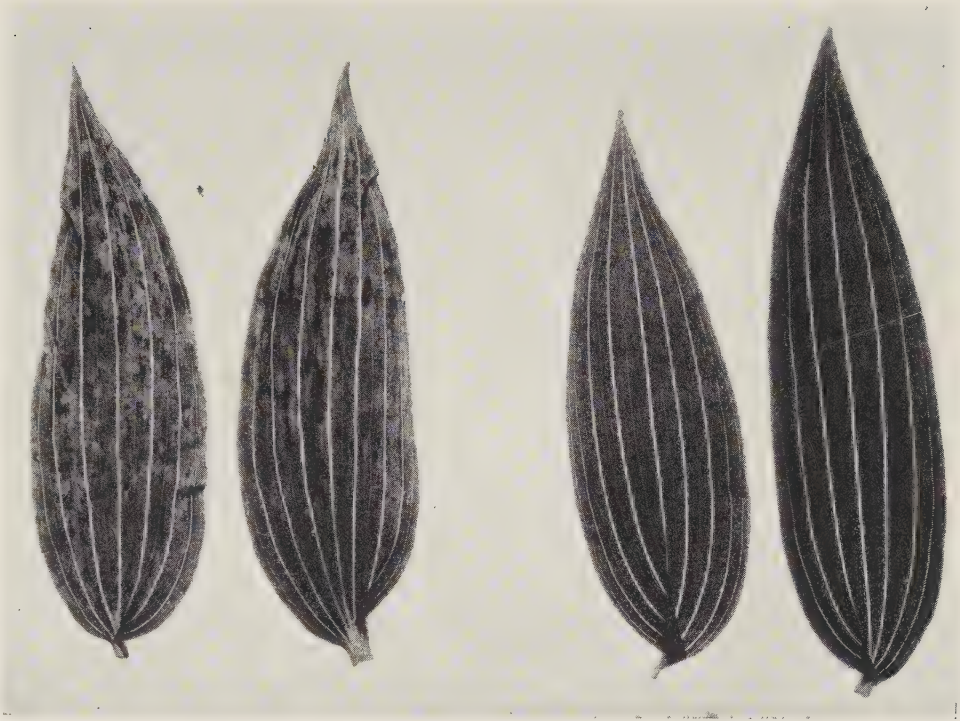
There are three diseases which I have not seen but will describe from the literature. One is caused by *Phytophthora cactorum*, and is found on candidum and pyrenaicum. It attacks the subterranean portion of the stem and does not show itself until the damage is done and the poor sick plant topples over.

The other is a disease of the stalk called "stump rot" and is also caused by a species of *Phytophthora*. This attacks the plant shortly before flowering and usually kills the tip of the stalk. The fungus lives in the soil and the spores are produced at the surface and splashed by the rains into the crown of the plants. The rot starts at the crown and follows down, destroying the entire stalk through to the bulb, or only the tip may be destroyed.

The third disease, called "yellow flat," is a widely distributed and serious disease of the Bermuda Lily in Bermuda. It is characterized by a downward curling of the leaves which are paler than normal but are not striped or mottled as is the case in the mosaic disease. The whole plant appears greatly dwarfed and bulbs from such plants reproduce the disease the following year. This infectious disease should be carefully watched for in this country and any plants suspected of having it should be destroyed as soon as possible.

For the last few years I have noticed that some of the freshly imported auratums, davuricum subspecies, henryi, tigrinum florepleno, and speciosum have their leaves blotched and streaked and sometimes striped with yellow and look as if some of the chlorophyll were missing here and there. This is the red flag sent out by the iniquitous plague called "mosaic." The second year of the disease the bulb is smaller and the plant no longer flowers and the stem gradually becomes twisted and the leaves turn to string-like distorted images of themselves. The plant may go on for several years always looking worse before it dies.

Similar mosaics are present on Tobacco, Narcissi, and many other plants and are all descended from one original Juke or Kallikak. The causal agent of mosaic diseases has become highly specialized to particular hosts in many cases. It is supposed by many investigators that this causal agent of mosaics



L. speciosum, diseased and healthy leaves. The diseased ones have mosaic. (Taken by Mr. Guterman.)

is some ultra-microscopic organism which has not yet been identified. It behaves in plants as malaria does in humans, only that the mosaics are incurable. The disease is carried by extremely small aphids, which play the rôle of the mosquitoes. The aphid in sucking the juices of a diseased plant picks up some of the infectious virus and later transmits it to the succeeding healthy plants upon which it feeds.

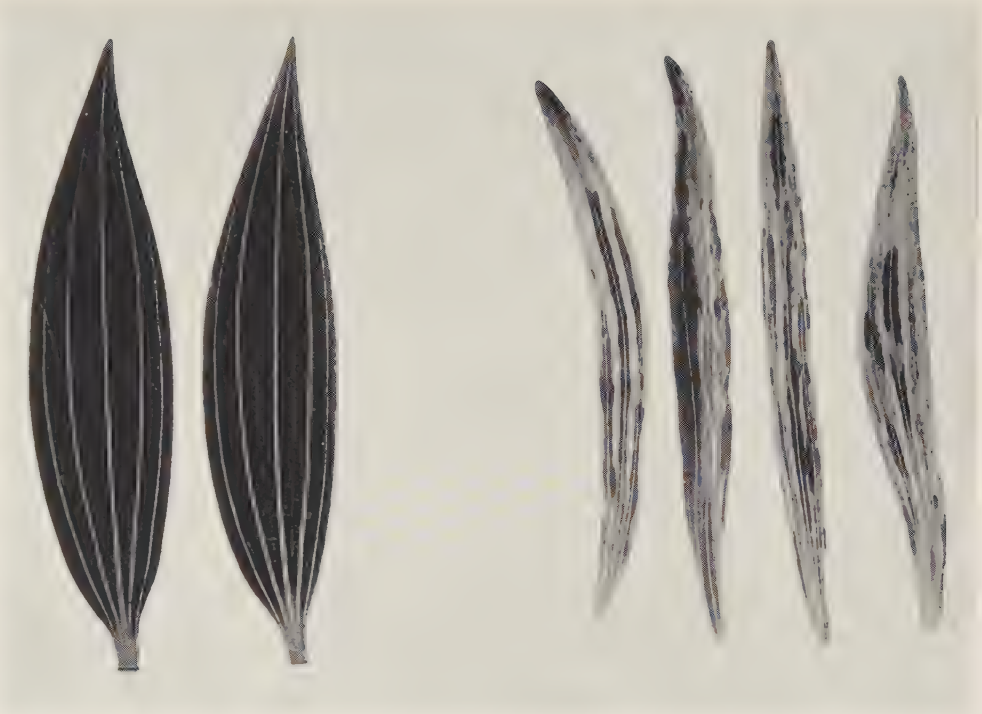
It requires several days after infection for the symptoms to appear and afterwards the virus penetrates to every part of the plant including bulbils and bulblets and thoroughly infects it forever after with an incurable disease. It does not show itself if infection occurs late in the summer which explains why bulbs of apparently healthy plants are sent out bearing the dread disease. But as soon as such bulbs put forth leaves in the spring they show that they are infected.

However, one should not rashly pull up every plant having some irregularity in the disposition of its chlorophyll, but should first make sure the bulbs are really ill.

The best way to control the disease and prevent it from spreading if it should creep in, is to "rogue out" (that is, dig up) and burn all plants showing definitely that they are infected and spray the healthy ones regularly with nicotine or tobacco dust to keep the aphids down.

Mr. George Massee in the Royal Horticultural Society's *Journal*, 1901, wrote a report on the diseases of the Lily. He said that *Botrytis cinerea Pers.*, to which the candidum and others are subject, causes orange brown spots to appear on the stems, pedicels, leaves, and flower buds. The spots gradually increase in size and become covered with a delicate gray mold consisting of the fructifications of the fungus. When this stage is reached the parts attacked are either completely destroyed or badly disfigured. The summer winds carry the mold from plant to plant. Some of it drops on the ground and forms cobweb-like wefts. It remains passive during the winter and may attack the bulb scales where it forms numerous small hard black bodies, called *sclerotia*. The following season these give origin to the gray fuzz which attacks the foliage. The fungus causing this disease thrives best under moist conditions and is therefore particularly troublesome during periods of wet weather and in moist, shady places.

This disease can be controlled. A preventive is to entirely surround the bulbs with sand. For the sand contains little moisture and no humus which are necessary for the fungus to live upon saprophytically before reaching the bulb. Cultivation of the soil and the removal of all decayed and diseased vegetable matter in which the fungus might live helps. When the spots appear on the leaves these



L. auratum, healthy leaves and ones sick with mosaic. (Taken by Mr. Guterman.)

should be picked off and burned, as this is one of the most effective ways of checking the disease. If the *Botrytis* is very severe the stems and foliage must be cut off and burned and the bulbs soaked in one of the mercuric compounds. Spraying with Bordeaux kills the fungus. It is a good plan not to wait for the disease to appear but to spray as soon as the leaves come out in the spring in order to ward it off entirely, just as we do with Roses to prevent black spot and mildew before it can get a start. If *Botrytis* is present the plants should be sprayed after every rain. We must become accustomed to spraying our Lilies. The chemicals in the sprays not only destroy the fungi and aphids but frequently act as a tonic and strengthen the plants.

The brownii and batemanniae in my garden had a disease which seemed to be *Botrytis*. This has been controlled with Bordeaux. A grower who had thousands of sargentiae affected this way has cured them by this method too, so it has been proven an effective remedy here in the United States.

We are often told to sprinkle flowers of sulphur over our Lily bulbs as a preventive against diseases. Heavy or continued applications of sulphur cause an acid reaction in the soil which may be unfavorable for the best cultural results. In my own experience I have not found sulphur of the slightest benefit for the control of diseases.

If the bulbs have been badly affected by any disease and there is danger that they have infected the soil, the best plan is to dig out all the sick bulbs, soak them in one of the organic mercuric compounds, and put them in the hospital. Then the ground should be cleansed before healthy bulbs are planted in it.

A Cornell University Bulletin, *Memoir* 89, March, 1925, tells how to cleanse the soil for Tulips affected with gray rot and the same method is also applicable to the soil for Lilies. It says, "The bulb rot pathogene (of the Tulips) may be largely eradicated and a good stand obtained by soil disinfection with formalin at the rate of 1 to 1½ lbs. to 5 or 6 square feet of soil." The formaldehyde should be diluted with enough water to thoroughly wet down from six to eight inches of loosely spaded soil. Pan steaming from one to one and a half hours is also effective.

In order to disinfect the tulips, all cankers and diseased parts were cut out and the bulbs then soaked for one-half hour in a 1 to 120 solution of formaldehyde, then rinsed through three changes of tap water and spread to dry. This treatment cured Tulip bulbs and, as it may be effective for Lilies, I have given it. So little is positively known about curing Lily diseases at the present writing that I have given all the sensible remedies. In time others will be tried out and the results of further experimentation made available to all Lily growers.

Many of the troubles with Lily bulbs come from the fact that they have to travel so far to reach us. Moreover the full-grown bulbs are so crippled from having their roots cut off or by drying out during the journey that they frequently never recover.

At present many failures are directly traceable to the catalogs. For these advertise and extol species which are not hardy. There are so many Lilies for every climate that each of us can have a plentiful supply even if we limit ourselves to those which are absolutely hardy and prolific in our own gardens. On the whole I have only a little Lily disease and when I do it is almost always traceable to the new arrivals.

The best way to avoid illness for plants as well as people, is to keep fit. To have strong, healthy Lilies able to resist disease, plant them the right depth, give them well-drained friable soil, water them during dry spells, and place the shade lovers in the shade and the sun lovers where the sun shines on their stems and flowers and the ground under them is shaded; give them plenty of room above and below the soil and — *raise your own stock.*

But if, in spite of all your care, the Lilies fail, do not be discouraged but try to recall what you did that was culturally bad for them and generally that will account for the trouble.

The worst pests are the pine mice and many ills attributed to strange and remote causes can be laid at the door of these ravenous little beasts. I have to admit that I have lost thousands of Tulip and Lily bulbs through them and used to feel as guilty and ashamed about it as any housekeeper who allows vermin to come into her kitchen or pantry. But now I console myself by thinking it is the fault of the people who have foolishly killed the snakes, owls, and other enemies of the mice.

I am sure word has gone forth through the surrounding countryside of the delectable food to be found at our place. For they crowd into the walled garden through the cracks in the foundation wall under the surface of the ground. Next year we are going to dig a big trench and sink fine mesh galvanized iron wire all along the wall. One of my friends plants his bulbs in wire baskets sunk into the ground and another plants hers in trenches lined with wire mesh.

Although I am a pacifist by conviction, deep down in me there must be strong warlike instincts, for I find myself in a most savage and vindictive frame of mind in regard to the mice. No sooner do I see their holes than I viciously pump cyanogas into them and close them up. Then on saucers (inverted covers of

L. longiflorum, the Easter Lily. Its stamens had been removed. The most popular Lily for pots.

preserving jars) I temptingly spread a commercial preparation of poisoned oatmeal camouflaged by a cover of evergreen sprigs with as little conscience qualms as any Borgia. Constant vigilance seems to be necessary to combat them and the other pests, but the effort is small in comparison with the reward of a gorgeous crop of healthy Lilies.

CHAPTER VIII

POT GARDENING WITH LILIES

WHEN the reader sees "pot gardening" he visualizes benches filled with pots of Lilies being forced under glass but I will quickly undeceive him, because my pot gardening has been entirely without the help of a greenhouse.

Gardening with pots is one of the frills or flourishes which come after the painful mastering of fundamentals with the acquisition of deftness and skill in handling one's material. Wherever the climate is dry, pot gardening abounds because a few plants in pots require less water than when they are planted out in a bed. In the courtyards along the Mediterranean littoral, pots climb up the stairways, peep through the iron grills of windows, and balance themselves along the tops of balustrades. They bring growing flowers to the unfruitful stones. While the pictures of Chinese gardens show whole borders made entirely of plants in pots.

To make a nice pot garden one must first have charming pots. Our common clay receptacles (I cannot keep on repeating "pots") are not in the least good looking and are usually kept out of sight.

In Spain and Italy, where every kitchen utensil is a thing of beauty, the everyday clay pots are most decorative. Ours are made with a thick band along the top called a "cup" because they do not break as easily when stacked as those with the graceful outward curving rims called "lips." At present we have to pay fabulous prices for handsome pots here or import them and have half of them break on the way. Undoubtedly in the near future the Five and Ten Cent stores will be selling homemade copies of the best Mediterranean and Chinese shapes.

One charm of pot gardening is its informality. The pots should not stand in rows or exactly balance each other, but be arranged in an artistic disorder and vary in size, shape, and color. However, one need not go to the other extreme and stand modern Viennese pots next to the classic Italian or Spanish ones. Only those look well together which are harmonious in character.

When my pots are filled and ready to set out, I call the Italian helper and ask him to place them. For although he is an illiterate day laborer, generations of art-loving ancestors have given him an innate sense of beauty and balance. Flattered at my request he answers with a delighted smile. Then he first steps back and studies the problem and after thinking it over for a while he very slowly and carefully lifts each pot as if it were a piece of

Venetian glass, and deliberately places it, never doing any over, and his effects are lovely.

Lilies do well in pots. They should be planted in deep, fairly wide receptacles and not crowded too closely together. The large bulbs should have five square inches of space and the small ones two. I planted three tigrinums, which are medium-sized bulbs, in a pot measuring nine inches in height and ten across the top, and in the same sized pot four elegans, which are small. Three in one pot are leafier and look less like lone toothpicks than one or even two. Every pot must have a hole in the bottom of it for drainage. Before filling them with soil a few lumps of charcoal, placed on either side and over the hole, will help the drainage and aid in keeping the soil sweet. The soil made up of two parts compost or topsoil and one part sand is filled in to a depth of four or five inches and the bulb placed on this and only just covered. More soil is added as the shoot grows until the pot is filled to within one inch of the top. This is done to force the bulb to grow the basal roots before the stem roots.

The pots filled with hardy Lilies can be wintered in well-drained coldframes standing on coal ashes or gravel and covered with rotted leaves or hay.

The more delicate species which otherwise we would have to relinquish altogether smile at us safely from their movable homes if they are wintered in the cellar along with the Hydrangeas and Oleanders.

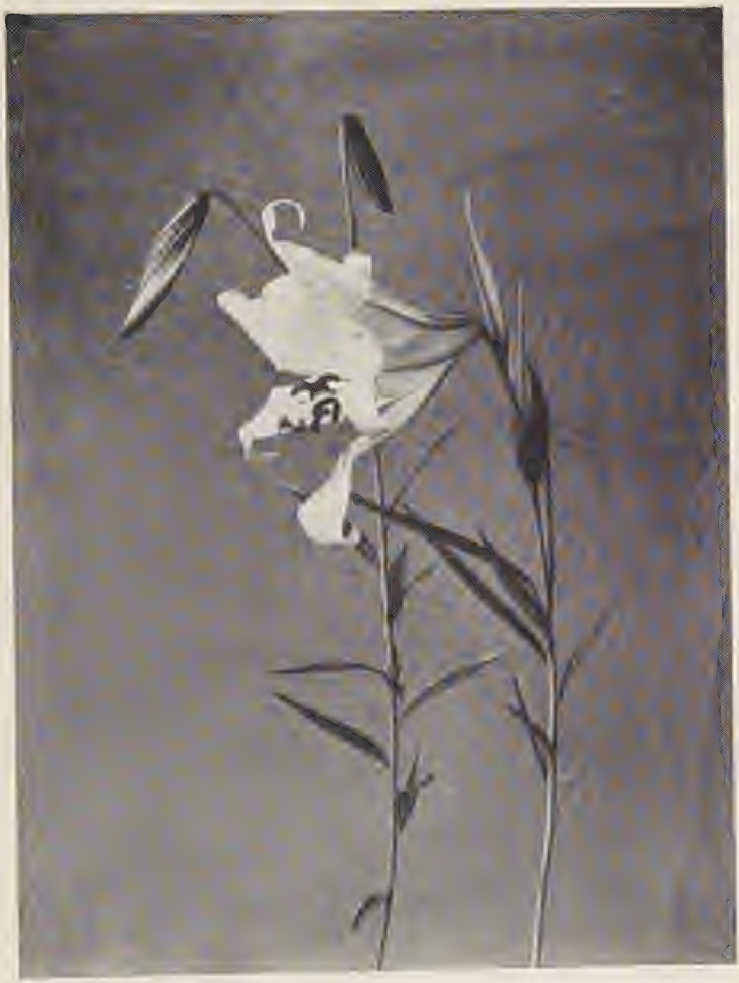
Formerly I put everything into the open ground and often lost the new arrivals because the labels disappeared, and being without identification tags they were weeded out by mistake or because of any of the dozens of possible disasters. Now the rare species which come after much correspondence and searching through catalogs are preserved from accidents by keeping them in pots until after we have seen what they are like and how they behave. Lilies which are attractive as potted plants are the dainty ones like tenuifolium, dwarf elegans, concolor, and medeoloides. The longiflorum and japonicum (both not hardy north of Washington) make fine pot plants. Davidii, willmottiae, and some of the davuricum subspecies thunbergianum, which held their flowers three weeks; auratums, which so often behave as an annual, are quite safe in pots, for if they become diseased they can be easily thrown out. Henryi is too tall, although I have seen them in pots standing on a terrace banked against the wall of a house most effectively. The double Tiger (tigrinum florepleno) is a stunning pot plant according to my sense of beauty, although many do not agree with me; and lots of others. Regale and speciosum do well in pots but better in the borders.

Except auratums I do not advise growing Lilies in pots which are subject to disease, such as sargentiae, batemanniae, candidum, and brownii, for the less obstacles we put in their way the better, and pots are not a normal home for them.

For three years in succession I have potted rubellums and they always languished away early in the summer with often not even a leaf to show, but at last I have had them flower. They are difficult to grow and must be wintered indoors.

I have read in the English magazines how the gardeners hurried the plant's growth by keeping it in a sheltered, sunny place and retarded it in a cool, shady one, but evidently on my wind-swept hilltop the plant's and my ideas of cool shade were different. For last year when I wished to astonish the garden club with some pale pink japonicums, those in the deep shade were coming along faster than the ones on the sunny terrace, so I brought them into my room and stood them in a dark corner and there we seemed to agree on exposure, for they opened obligingly the day the company arrived.

The plants in pots have to be watered every day unless it rains. Then only can we rest our tired limbs and enjoy the cool evening air scented with the rain-drenched leaves and flowers. Otherwise this delicious time of day is spent quenching the thirst of the plants.



L. japonicum, grown at Foxden in a pot.

Unless there is a comfortably convenient water supply the nightly drawing of water becomes burdensome. It is much easier to dip the can into a pool and fill it all at once than to wait while the water from the faucet slowly fills it up. Watering with an unwieldy hose is not satisfactory as it splashes the earth all over the pots.

The potted plants do not join the company until they have outgrown their straggly adolescence and reached their prime, and as soon as age comes upon them they are sent down to the vegetable garden and sunk into the ground to rejuvenate.

A pot of rosy japonicums or orange elegans is like a brush full of paint ready to be daubed on the canvas to fill the unexpected but ever occurring vacant space where Jack Frost lingers too late or the greedy cutworms have taken their toll of casualties.

With pots we can change the scene oftener than if the plants were rooted in the soil. In the days of Louis XIV the flowers in the parterres at Versailles were changed once and sometimes even twice a day so that a different combination of color and form would greet the king every time he passed by. Ours is a restless age, but even if we had the necessary army of gardeners we would not care to change as often as that.

We can arrange lovely flower pictures with only a few pots. Blue Agapanthus (in pots in my garden although I know it flourishes in the borders in California) standing behind orange Lilies; orange davidii placed against a wall over which purple Clematis cascades; pink japonicum in front of Delphiniums; longiflorum flanking the Rose arbor are only a few of the enchanting possibilities.

Though he cannot write books or compose songs the gardener can create beautiful but short-lived pictures with potted plants which are as easily moved about as the notes on the staff or the words in a sentence.

CHAPTER IX

IN JARS AND VASES

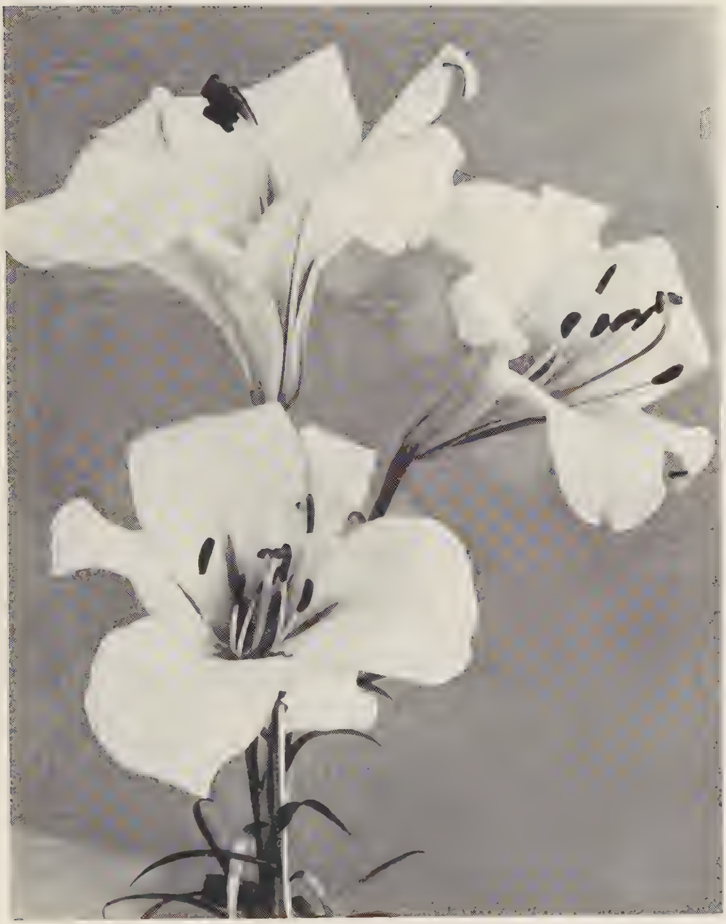
FLOWERS arranged indoors create charming but fleeting pictures. If they are not a success one can tumble the flowers out and begin all over again.

The color of the walls can either add to, or detract from, the effectiveness of the flowers which, like gracious women, shine to better advantage against becoming backgrounds. The walls of our living room used to be finished in dead white plaster as austere as a monastery. Their cool severity outlined every object harshly, cast black shadows on the flowers, and altogether prevented our having white ones because there was no contrast in color. Now they have been painted buff and wiped with gold, and like gilded picture frames bring out the color values in every flower picture. Gray walls look well only in sunny rooms, light blue is chilling and inhospitable, while red is too bright in itself. Soft green, turquoise blue, buff, gold, cream, or the browns of wood paneling harmonize with all the colored flowers and throw the white ones into relief.

On paper we can plan a succession of bloom to match our rooms for all summer, but out in the garden the cutworms, slugs, or rabbits are sure to nibble at our precious Larkspurs or Ageratums, especially when there are no more of them left in the coldframe to replace the losses. Then for the few weeks when these were to have been the glory of the parlor, we have to go into the fields to find others and often bring back hitherto untamed wildings, which prove surprisingly effective substitutes; such as philadelphicum, which flourishes vigorously in the field across the way, but has an aggravating way of vanishing from my garden.

One kind of flower dominating the scheme of decorations at a time, such as Iris, or Dahlias, with the delicate, feathery sorts used as subsidiary luminaries, is effective, especially if there are only a few jars in the room. All the varieties in the garden bursting out of vases and bowls standing on every flat surface in the room fill it with a confusion of color and pattern.

The Lilies should not be put in with other flowers so striking in form and color as to detract from them, and each shape should be kept to itself. The upright shapes seem to aspire and the nodding ones to give. Bringing them together is trying to say two different things at the same time. The misty flowers such as Gypsophila, Rue, Shrubby Clematis, and Sea-Lavender, or the foliage of plants like Hemerocallis or Hostas (our old friend the Funkias under



L. regale.

a new alias) and Ferns arranged with them act as a gentle accompaniment to the melody.

Most Lilies are too topheavy to be propped up in flower holders in the center of shallow containers and should be placed in tall glass jars tinted gold, green, or blue, which show the whole length of the graceful stems. They also look well in pottery vases of solid colors or in silver or pewter containers.

Years ago when my acquaintance with the Lily was slight, I invariably associated them with funerals or church decorations at Easter. If a psychologist had asked me to describe what mental picture the word "Lily" called forth, I would have said a sheaf of long Palm leaves to which were tied with an enormous purple bow a bunch of greenish white trumpet-shaped flowers (longiflorum). Others must have had the same experience and I am hoping the regales will not meet a like fate, for with their golden throats and rosy tubes paling into white they are typical of joy and belong to festive occasions.

They melt into rooms furnished with old tapestries and dark wood paneling, but in humble surroundings they radiate a splendor of their own. Their scent is not strong enough to be unpleasant, like that of auratums, whose smell gives me a headache. As some members of the family like it I do not think it always affects people this way. Just the same I would never risk sending them to a sick person.

Indoors their huge flowers and frilly segments are striking in high jars.

The flowers used for decorations on important occasions in the life of any one person, such as a birthday, a début, or a wedding, ought to suit the celebrant. Some people resemble stately Lilies, but others are more like climbing Clematis or brisk Daisies. Regales would be appropriate for tall, willowy brides, but too big and heavy for short or dumpy ones.

Lilies good for cutting are candidums lovely with Delphiniums indoors as well as out, philadelphicum, longiflorum, white martagon, croceum, and many of the davuricum subspecies thunbergianum, both dwarf and tall, some of which remain fresh for two weeks in water.

Some day when I have so many of the tenuifolium, concolor, medeoloides, and other delicate, scentless members of the family that I will not have to hoard each flower for its seed, I will cut them lavishly and fill the house with them.

Speciosum is one of the best for cutting with its butterfly-like anthers and spicily scented blooms. The white ones combine well with blue Hosta and the pink with foliage plants and they also look well when left to themselves.

The stems of henryi and willmottiae are weak for cut flowers, and tigrinums are a bit coarse. The stems and foliage of humboldtii are too stiff, but pardalinum and superbum, I should think, would be handsome indoors, although I must confess I never had the heart to cut my few precious specimens when there were always plenty of other flowers for the house. But I can imagine how stunning their orange tones would be in a great copper pitcher brought from France or in a large blue and white Chinese jar standing on the floor.

In cutting Lily blooms at least eighteen inches or more of the stem should be left so that there will be sufficient leaves remaining to store up next year's growth, for the leaves are the lungs of the plants. If you allow enough leaves to remain it really strengthens the plant to cut off the flowers, as it does not have to spend any energy in ripening seeds. I have noticed that when the flowers are cut the stem dies down earlier than when the seed capsules are left to mature.

When the Lilies are shipped the anthers are often removed to prevent the pollen from being shaken on to the perianth and spotting it, and the poor flower is sent out into the world shorn of one of its greatest charms, like a young girl going to a party with a mask over her eyes. In England, before shipping the Lilies, they wrap soft tissue paper around the anthers while they are still tightly closed and stiff and before they curve out and become pendulous to obviate the necessity of cutting them off.

pardalinum — sun,
  var. angustifolium — sun,
  var. minor — sun,
parryi — partial shade,
parvum — partial shade,
  var. luteum,
roezlii — partial shade,
rubescens — partial shade,
washingtonianum — moderate shade and sun,
  var. purpureum — moderate shade and sun,
  var. minor — moderate shade.

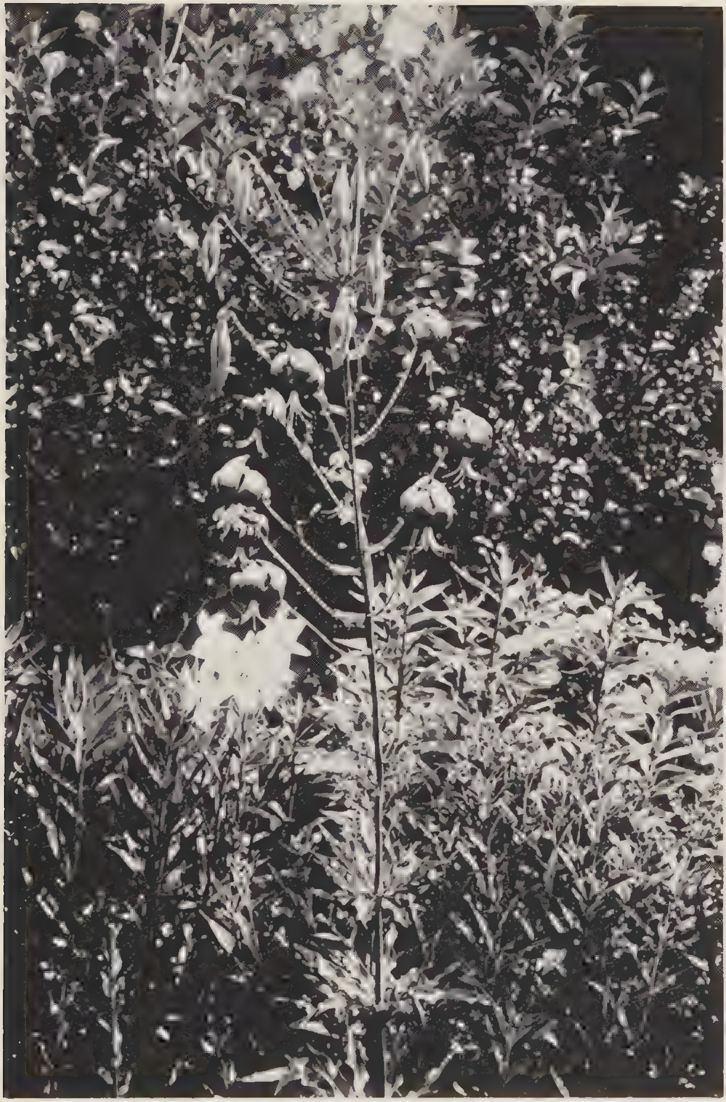
WE Americans are rich in Lilies and on our walks often have the thrill of finding the flame-like philadelphicum gleaming against the dark green of the woods. In the West, as we pick our way through shrubs on a mountainside, a delicious whiff heralds the presence of rubescens, amazingly beautiful with its cluster of Lilies, white on top and flushing through pink to almost crimson at the base.

Our treasure chest contains nineteen species. They are spread over the whole country from Quebec south to Florida and southwest to Mexico and all along the west coast to British Columbia. Twelve species grow west of the Rocky Mountains. All of them are found in varying types of locations, some grow along the seacoast, such as maritimum and occidentalis, and others climb high up into the

Sierras as far as 10,000 feet, as parryi and parvum. Our tall ones, like superbum and humboldtii, grow as high as eight or nine feet and there is a little one, bolanderi, barely two feet high. Most of the Americans are woodland Lilies and a few, like canadense and superbum, grow wild in both sun and a little shade. None of them grow in deep shade, for even the woodland ones like the sun for some hours during the day, and all of them, as mentioned earlier, like a low growth about their feet. The soil under them should be kept moist but not wet for all the Lilies except philadelphicum, until after they have flowered.

We only possess two upright forms, the philadelphicum and the catesbaei, both daintier and of thinner texture than the similarly shaped tribes of davuricums and croceums from Europe and Asia. Washingtonianum, rubescens, parryi, bolanderi, kelloggii, and parvum have more or less ascending flowers, and all the rest have crisply reflexed segments and either jauntily fling their small heads out straight or bend them down. Their stems generally need no support and easily carry the well-poised cluster of nodding Lilies. Some of the Westerners and one Easterner, carolinianum, are deliciously fragrant with a fresh, stimulating scent.

All of these Lilies, except the three graces of the pinkish purple group, the washingtonianum, rubes-



L. humboldtii in the border at Foxden.

cens, and kelloggii, are in brightly glowing tones of yellow orange or red, and most of them are dappled and freckled. There are no heavy headed and languorously scented white ones like the Oriental longiflorum and regale.

Our elusive Lilies resent being caught and prefer rough camping in their cool woods to being domiciled in stuffy gardens. However, they are so graceful and fluttery that it is strange more gardeners have not tried to put salt on their tails.

These Lilies grow where the land is wet during the winter and spring. In the cold regions or on mountain tops they seek places where the ground is kept moist by the snow from the time it falls until after it has melted in the spring, and in warmer places they find banks of streams or land watered by springs. Often these woods and fields are absolutely dry in summer, when the bulb rests.

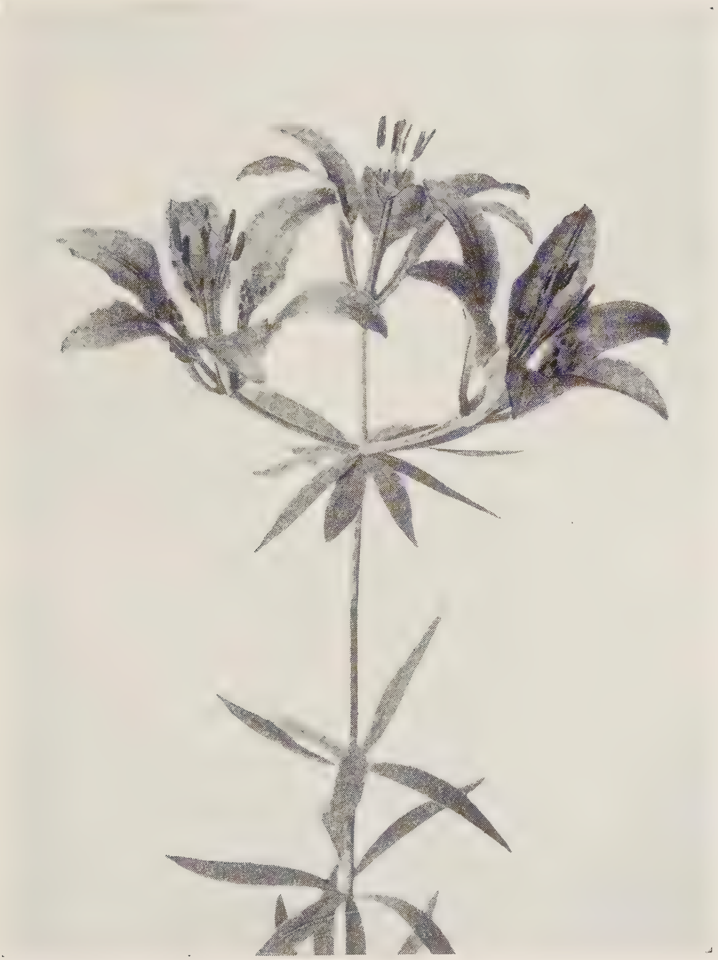
In transplanting the wild plants from the woods and meadows it is not always essential to duplicate the native-soil conditions, for many plants have taken to certain locations because they had to and not from choice. Often they grow in acid soil because they have been thrust out of sweet ones by more vigorously growing plants. When they are moved to the garden and no longer have to fight unfavorable conditions, they grow stronger and taller and bear more flowers than they ever did in the wild.

One Western wood Lily, the humboldtii, luxuriates in the glaring sun in my garden and I think others might, too, because they do not require as much protection against our feebler Eastern sun as they do in the hotter golden West.

The bulbs of the American Lilies are distinctive and are either composed of a branching rhizome having clusters of scales along it at intervals, as in superbum, canadense, pardalinum, and parvum; or they are oblique with crowded, long, thin scales slanting up from a creeping stem. In the oblique bulbs the flowering stem rises from the outermost end of it where the newest scales were formed, as in humboldtii, rubescens, and washingtonianum. Many of the bulbs have jointed scales and the absence or presence of this characteristic has been a determining factor in making varietal distinctions.

Some of the Lilies are temperamental in their complexions, as in humboldtii, where I have seen two flowers on the same stem with different spotting. So it is a little confusing to find that merely a new combination of dots and blotches has often been pigeon-holed as a new variety.

No description, even if it is accurate and artistic, is as vivid or real as seeing the living plant. I never could understand the differences between pardalinum, humboldtii, and superbum until I saw them. Then the stiff character of humboldtii with its dark,



L. philadelphicum, a wild plant

roughened, rigid stem carrying whorls of shiny leaves standing out like ballet dancers' skirts was utterly different from the lighter green willowy floppiness of pardalinum and superbum. The only constant distinction between these last two is in the bulbs and in superbum's triangular green heart; pardalinum's being green but not triangular. At times the leopard-like spots of the one and the freckles of the other are entirely distinct, but sometimes members of both species will be very similar. Once when visiting a garden I was asked by the gardener who had grown superbums from seed whether his Lilies were pardalinums (which he hoped they were), and I could tell only by lifting up their heads and looking into their hearts.

Although in general it is merely wasting energy and sometimes inviting disaster to grow plants which are sure to lead a life of semi-invalidism in a certain location, still we cannot always be cautious and sensible and must occasionally indulge in foolishness. Most of us make favorites of one family, such as the Rose or Dahlia, and here is where we become reckless, for we long for the very members of the family which we know are difficult to establish. This difficulty is partly what attracts us and puts us on our mettle.

To me the washingtonianum, rubescens, and parryi are the ever luring beauties of the promised land

and I keep on trying to wheedle them into staying with me. After much effort, rubescens seems about to settle down in the semi-shade of an open hillside. Two bulbs out of twelve original washingtonianum purpureum have come up for three successive seasons weak and wobbly, to be sure, but there. As for parryi, I know from gardeners, who have had success with it in Medina, New York, and on Long Island, that it is not the rigors of the climate that interfere with its domestication in New York State.

The hardy Americans to date in my garden are parvum, superbum, canadense, pardalinum, and humboldtii. Columbianum and kelloggii promise well. Philadelphicum is thriving in the rock garden of a neighbor. Parryi, washingtonianum var. purpureum, rubescens, and bolanderi can stand the New York winters. I have not tried roezlii but imagine it is hardy.

Around Washington, D. C., all of them seem to prosper, and of course in the South and West the tender ones ought to grow well. I should think Southerners would try that strange insect-like flower, the catesbaei, whose segments look like insects' feelers, and carolinianum on account of its fragrance.

The American Lilies have not produced as many bulb offsets as the Asiatic and European species in my garden. However, pardalinum produced twenty stalks in three years in a garden at Washington, D. C. The tale of the rate of multiplication of this Lily sounds like one of those yarns the Westerners love to put over on the tenderfoot. Mr. Purdy tells us he has counted up to five hundred stalks of these vampish flowers in one clump. And we hear that the Chinese in California eat these bulbs, but that instead of having the indefinable taste of some exotic fruit they taste like "the common garden bean." However, to hold back the hungry reader from replenishing the larder with his Lily bulbs I will warn him that the bulbs of humboldtii and perhaps others are so bitter that even the mice avoid them.

Many of these Lilies produce quantities of fertile seed which generally do not show any leaf stalk above the ground the first year, but spend the time growing fat and round in the earth. They flower three to four years after planting.

American Lilies do not seem as subject to disease as the Asiatic ones. Only canadense and superbum have become sick with me and they might have been infected from growing close to diseased auratums and speciosums.

I have written more fully about the American Lilies than the Asiatic and European ones.

There is no one rule for growing them applicable to all of these Lilies, and I have tried to make their cultural requirements clear in the following lists. When I did not know about the depth of planting or presence of stem roots I left it out. "Depth of Planting" figures mean from the bottom of the bulb to the surface of the soil.

L. CANADENSE LINNAEUS

Canada Lily, or Meadow Lily

Habitat. It is found from Nova Scotia to Ontario, down to Georgia and Alabama, and west to Mississippi, Nebraska, and Minnesota. It ascends to 6000 feet in North Carolina. Generally it grows in meadows or on the edge of woodland where it is wet in winter and spring and dry in summer, in acid soil in both half shade and full sun.

Description. The whole plant has a downward graceful movement and looks like a slender, tiered green belfry ringing golden bells. The stem is smooth grayish green generally 3 feet but occasionally as high as 7 feet. The leaves are dull green, slightly hairy along margins and on under surface, the texture is thin and they droop. The flowers are nodding, bell-shaped with the segments flaring out slightly and not turning back at all. They are heavily dotted on the inside with purplish brown dots and are generally yellow but often shade to deeper orange; pistil green, anthers brown. Color of pollen varies from light gold in lighter flowers to purplish brown in dark red ones. I have seen three stems in one colony each carrying flowers of a different shade, one yellow, one orange, and one distinctly red.

Season of Bloom. End of June on to end of July.

Bulb. Rhizomatous, a thick stem along which the clusters of bulb scales form. Clusters 1½ inches wide and 1 inch through, scales like kernels of corn.

Depth of Planting. 8 to 12 inches.

Stem Roots. Has small stem roots.

Increase. It bears quantities of fertile seed which do not send up a stalk the first year and flower in 3 to 4 years after planting.

Culture. It can be transplanted late in August or early in September as the stem dies down early, will grow in neutral soil, hardy and popular, grown extensively in gardens, occasionally subject to disease in cultivation, but I never saw them sick when wild.

Varieties. Var. rubrum, with a dark red flower, otherwise the same; this is sometimes sold as L. grayi.

L. CATESBAEI WALT.

Catesby's Lily

Habitat. Found in the southern portion of the United States from North Carolina to Florida and from southern Illinois and Missouri in low grassy pine barrens, in open woods, and also reported from moist ground.

Description. An odd-looking slender scarlet upright Lily with segments terminating in pointed elongated tips. The stem is 2 feet high. The leaves are linear, very narrow, grass-like, scattered along the stem. The flower is upright, usually solitary, sometimes 6 inches across. Perianth divisions have narrow claws and are separated all the way down. They are undulate and the tips curve down and wave about. The segments are scarlet with a yellow purple-spotted base.

Season of Bloom. July and August and even to September 7th.

Bulb. Small, somewhat like philadelphicum, scales thin, narrow leaf bearing.

Depth of Planting. Shallow planting on account of leaf-bearing scales.

Stem Roots. None.

Increase. Seed pods have been found on it, so it presumably can be raised from seed.

Culture. Not grown in gardens that I know of.

L. CAROLINIANUM MICHAUX

Southern Swamp Lily

Habitat. It is a high-altitude plant found at from 2700 to 4500 feet altitude, along creeks and in rich woods in southern West Virginia, Tennessee, Alabama, and North Carolina.

Description. A low plant with nodding red flowers whose reflexed segments terminate in a long drawn out point and look as if they had been blown back by a strong wind. The stem is 18 inches to 3½ feet high, very slender, sometimes tapering. The leaves are smooth, obtuse, arranged in whorls. The flowers are on long pedicels, one to three, with segments four inches long, sometimes smaller, of thin texture and curve back and are orange red, with purple spots. They are delicately fragrant.

Season of Bloom. July, August.

Bulb. Stoloniferous born on short root stocks composed of numerous fleshy scales.

Stem Roots. Has stem roots.

Increase. It sets fertile seed and produces flowers in four years.

Culture. I only know of one man who grows it and he lives in North Carolina and raised it from seed. He says it likes rich loam and sun or partial shade and that it is killed by frost.

L. GRAYI WATSON

Gray's Lily

Habitat. Found in open woods at 5000 feet altitude and along rivers on peaks of Otter in Virginia, and in moist soil in North Carolina.

Description. A medium tall Lily with whorled leaves and at its summit bearing a few horizontally placed red flowers, like thimbles, small in proportion to the height of the leafy stem. The stem is 2 to 4 feet high. The leaves are roughened with tiny hairs along back, in whorls, very much like canadense, base of stem naked, leaves wider near base of stem. There are 1 to 6 flowers and when we lift them to peer into them we see that the inside of the dull red flower is richly colored. The segments are orange, with red pointed tips, the orange part heavily spotted with purplish brown. The flowers grow wider toward the base but do not curve out or back.

Season of Bloom. June, July, August.

Bulb. Rhizomatous, with small round fleshy scales in clusters at intervals along the fleshy root stock.

Depth of Planting. 8 to 10 inches.

Increase. It has a fig-shaped capsule and presumably can be raised from seed. This ripens early in September, so the plant should be moved in September.

Culture. I have seen it growing in the New York Botanical Garden. It grew years ago at the Harvard Botanical Garden, but the records of its behavior there have been lost. It is again being grown there in the "bog" where there is not sufficient drainage and in Washington in semi-shade. An article in the *Garden* for 1907 says, "It is easy to grow in any damp but not shady situation, such as banks of streams or cool fernery. Often appears quite at its best with hardy Orchids and moisture-loving Iris." It should be grown in semi-shade. I do not consider it a Lily for any but the collector or hybridizer.

L. MICHIGANENSE FARWELL

The Michigan Lily

Habitat. From Missouri, Minnesota, and Wisconsin, in rocky woods.

Description. The stem is 32 inches high. The leaves have roughened edges like canadense and they are arranged in whorls. The orange flowers shaded red and spotted purplish brown are open and with much reflexed segments like superbum. In the Gray Herbarium on a specimen a note says, "It differs from canadense of the Atlantic and New England states by recurved, mainly reddish perianth lobes. It is readily told from superbum by its oblong short anthers and inflorescence." A photograph shows the inflorescence to be in an umbel.

Season of Bloom. Late June, July.

Bulb. A branching rhizome with clusters of scales like that of canadense and superbum.

Culture. It is surely hardy and worth trying. It is growing in a garden at Washington, D. C., where I saw it and took my notes.

L. PHILADELPHICUM LINNAEUS *

The Wild Orange Lily, the Red Lily, the Wood Lily, the Glade Lily, the Flame Lily, the Huckleberry Lily

The multiplicity of names indicates its popularity.

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* "Montanum" is a name given by some botanists to the philadelphicums found in the West, but there does not seem to be any difference between these and the type. Gray says it is not separated by any constant character.

A variety with pure yellow flowers was collected by Professor Sargent at Riverton, Massachusetts. It flowered in August, and is slenderer than the type.

Habitat. From Saskatchewan to Quebec, south to West Virginia and North Carolina, and west to New Mexico, Michigan, Wisconsin, and Colorado. From sea level to a height of 4000 feet. Found on dry hillsides amongst shrubs often in Sumac at the edge of woods.

Description. A fiery cup with flaring slightly rippled margins held aloft in a slender green stem clothed with a few star-like whorls of leaves. The stem is from 2 to 3 feet high. The leaves are thin with margins finely roughened and arranged in whorls with a few scattered above and below. They are not crowded but spaced fairly far apart. There are from 3 to 5 flowers on a stem, sometimes measuring 4 inches across. The segments have a narrow claw and are green at the base turning orange and terminating in scarlet. The orange part has purplish brown dots. The scarlet pistils stand up a little higher than the perianth and are taller than the short stigma. Vivid, dainty flowers, resenting interference.

Season of Bloom. End of June, July.

Bulb. 1 inch through and 1 inch across with fleshy jointed scales, very brittle, like pointed ears of corn carelessly assembled. The smaller bulbs give smaller plants and vice versa.

Depth of Planting. From 3 to 6 inches according to the size of the bulb.

Stem Roots. A few.

Increase. From seeds and from bulb scales.

Culture. The New York Botanical Garden has grown them in pots and forced them in the greenhouse, but they were poor specimens. The best time to move them seems to be when they are in flower or directly afterwards. Miss Preston could not establish it in Ottawa, nor could I in my garden, but it is reported as doing well in cultivation in Southwick, Mass., and at Medina, N. Y., where it seeded and throve, and at Peekskill in the rock garden of a neighbor. It is a plant for the rock garden on account of requiring very dry soil. In the wild it grows in acid soil. It is a difficult Lily to grow.

Var. umbellatum, also called andinum, washauricum, lanceolatum. Dr. Britton thinks it is a thin-leaved race of the philadelphicum growing in high altitudes.

Var. flaviflorum. In Rhodora it is reported as growing at Providence, Rhode Island, and there are specimens of it in the Gray Herbarium from New Hampshire and Maine. It has clear yellow flowers splashed with purple spots and inside near the base is not as deeply colored as in typical plants.

L. SUPERBUM LINNAEUS

American Turk's Cap Lily, Swamp Lily, Nodding Lily, Wild Tiger Lily

Habitat. From Georgia and Alabama to New Brunswick and as far West as Yellowstone and Wisconsin. Found in various kinds of places in rich open shaded ground, in meadows near the coast, in borders of swamps, in open woods, in swamp thickets, and at an altitude of 4500 feet in the mountains of Virginia.

Description. I have reserved the word "grand" for this Lily. Its tall stem bears a pyramid of an unbelievable number of swaying, nodding orange-red freckled flowers with rolled-back segments. The stem is 3 to 8 feet high, green tinged with purple, and has grayish bloom on it. The leaves are smooth, light-yellowish green in 3 to 6 whorls with a few scattered above. The flower bud is triangular and there are from 1 to as many as 40 flowers on a stem. They grow in a pyramidal raceme or, if few in an umbel, on pedicels which are subtended by a bract. Their distinguishing mark is a glistening green double triangle at the base of the segments, their nectar furrow. The segments are orange shading to scarlet, the orange part being heavily spotted with large and small reddish brown spots.

Season of Bloom. End of July into August.

Bulb. Like an enlarged canadense, a fleshy root stock along which at intervals are clusters of scales like fat grains of corn set irregularly on the cob. These bulb-like clusters are 2 inches across and 1½ inches high.

Depth of Planting. 8 to 12 inches deep.

Stem Roots. Has stem roots.

Increase. They are easily raised from seed and produce flowers in three or four years. The seed spends the first year under the ground.

Culture. They form striking plants and look their best naturalized in the bay of a shrubbery rising from grass with near-by trees casting a little shade on them. They are a popular garden Lily and grown, according to my reports, from Washington to Massachusetts and south to Washington, D. C. They could be grown anywhere in the United States and are generally planted in leaf mold and in partial shade. The ground under them should be kept moist until after they have flowered. They are sometimes subject to disease in cultivation.

L. BOLANDERI Watson

Bolander's Lily

Habitat. Confined to a restricted area in the mountains of the west coast between California and Oregon and fifty miles back from the Pacific Ocean. It is found growing amongst underbrush in open woods.

Description. A small dainty plant with wine-red ascending flowers dotted with brownish purple. The stem, 1 to 3 feet high, is gray green with a purplish cast to it. The leaves are stiff, arranged in whorls. Mr. Purdy describes them as narrow trumpets like the Fritillarias with recurved pointed tips.

Season of Bloom. June.

Bulb. Oblique, creamy, very like columbianum, 2½ inches high and 2 inches across and showing the stem all along the base; the scales are long, narrow, and curved, loosely articulate.

Culture. Miss Preston in Canada had it and lost it, and Mr. Pierce in Washington, D. C., had it in flower the first year after planting. He has it in poor, loamy soil in the partial shade of shrubs. I have had it only one year in half shade. It lived through the first winter and each of the stems had flower buds.

L. COLUMBIANUM HANSON

Columbia Tiger Lily or the Oregon Lily

It is named after the Columbia River near which it grows.

Habitat. Columbianum is found from British Columbia south to northern California and follows the Columbia River throughout the coast range. It is found in sandy, well-drained soil amongst ferns and in open woods. It is frequent in its habitat.

Description. The plant looks somewhat like a miniature humboldtii. The stem is 2 to 3½ feet high, slender, tapering, smooth, and grows out from one side of the bulb as in humboldtii. The leaves are smooth, shiny, and in whorls. The tiny flowers are as many as twelve arranged in a many-flowered raceme, and have a short tube and rolled-back segments of bright reddish orange with small purplish dots. Stamens a little longer than style, anthers yellow, faintly fragrant.

Season of Bloom. July, beginning of August.

Bulb. 1½ inches high and 2 inches across, solitary, coming to a point. The creamy scales, not jointed, are thin and articulated. Mr. Purdy says the bulbs are so small that in handling for shipping, to prevent them losing their vitality, it is best to keep them in moist peat when out of the ground.

Depth of Planting. Not deep — 3 inches.

Increase. Produced seeds in the wild.

Culture. Miss Preston in Ottawa has had it for two years where it has not increased at all. It has grown for one year in Washington, D. C., in poor, sandy loam and partial shade and in the state of Washington in semi-shade. It lived through its first winter with me and out of seven plants one had a flower bud.

L. HUMBOLDTII ROEZL AND LEICHTLIN

Humboldt's Lily

Was discovered in 1896 by Roezl on the centenary of Humboldt's birthday and therefore named after him.

Habitat. Found in the Sierra Nevada Range of central California usually at an altitude of 2500 to 4000 feet. It grows as far south as San Diego and north to Oregon. It is a woodland Lily found associated with yellow pine and deciduous oaks in open forests where the trees are scattered and is not confined to any special exposure.

Description. It has a stiffly erect, roughened stem and its shiny dark green leaves are stiff, too, and stand out like starched petticoats. The pedicels arch like swans' necks swinging the flowers from their beaks. The nodding orange reflexed flowers are spotted with purple, as if a child had painstakingly begun to dot them and becoming tired had merely made blotches and when reaching the tips had let the paint run all over the surface. The marking is very variable, and is hardly a basis for varietal classification, the flowers on the same stem being different. The stem is 4 to 8 feet high, the base naked, rather stout and slightly roughened, brown flecked with green. The leaves are in whorls growing shorter as they ascend, and are hairy below and on the margins, shiny on top, undulate at edges terminating in a sharp point. The flowers are 3 inches across, 10 to 15 on a stem in a pyramidal raceme. There is a green heart in each flower.

Season of Bloom. Late June to early August.

Bulb. Huge, reddish — scales thin, loosely articulated, and numerous, bulbs 4 inches across and 2½ inches high, oblique — scales not jointed. Each year a scar is left by the stem as the decay of the old scales is very slow. Mr. Purdy has counted as many as 15 to 20 scars. The scales are bitter.

Depth of Planting. 12 to 15 inches.

Stem Roots. None.

Increase. Mr. Purdy says it needs moisture to set seeds. Can be increased from bulb scales.

Culture. I have had the type and the variety magnificum for five years in my garden in the hot sun, and both get bigger and handsomer and bear more flowers every year. However, I think it might prefer a little shade. The ground under it should be kept moist until after it has flowered. I consider this the most striking of all the garden Lilies.

L. HUMBOLDTII VAR. MAGNIFICUM

Habitat. It grows in low altitudes in canyons of the mountains of southern California, in the islands off the coast of California, and along the coast as far north as Santa Barbara.

Mr. Purdy says this variety has larger bulbs with a few jointed scales on each one, that it has *many stem roots* and should be planted very deep, that the foliage is smoother and darker than the type and is characterized by the spotting of the flowers, each spot being surrounded with a crimson circle. They bloom the first year after planting and are very hardy in gardens. He says it did well in Ohio, and I have reports of its doing well from Medina, N. Y., Granite Springs, Washington (where the sun bleached the flowers), and in my own garden.

L. HUMBOLDTII VAR. BLOOMERIANUM *

Habitat. It grows in the upper reaches of pine and deciduous forests as high up as 10,000 feet and in the two southern counties of California adjoining the boundary of southern California.

Description. It is exactly like humboldtii magnificum except that it is a *smaller form.* It is handsome and slender, and has a stem 2½ to 4 feet high with a few flowers colored as in magnificum. The bulbs are 3 inches high and 2 inches across. Some of them are oblique and some pointed. They are not shaped uniformly. The scales are conspicuously jointed and easily detached, so they have to be handled carefully. It usually flowers the first season after moving.

L. KELLOGGII PURDY

Kellogg's Lily

Habitat. Found in a small area, 50 miles of narrow belt from Humboldt County (northwestern California), north, either in open redwood forest or in open pine woods in soils which are always rather dry and clayey.

Description. A wood Lily whose stem has whorled leaves and bears tightly rolled back pinkish-mauve fragrant flowers dotted lightly with purple and banded with yellow. The stem is 2 to 5 feet high, slender tinged purplish brown with a bloom on it. The leaves are in several short stiff whorls of as many as 17 leaves, curled up narrow and pointed. The flowers are 3 to 8 in a raceme. Mr. Purdy has had them with 20 flowers under cultivation. Segments are 2 inches long, closely revolute, and as much reflexed as pardalinum. Unique fragrance a little like Clematis.

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* Purdy's description.

Season of Bloom. May, June.

Bulb. Small creamy pointed, 3 inches high and 2½ inches across, scales long narrow and pointed at tip, with tough fibrous roots from base of bulb.

Stem Roots. No stem roots.

Increase. Grows quickly from seeds.

Culture. Mr. Purdy finds it easy to grow and that a good percentage of mature bulbs will flower the first year and that finer bulbs are produced in cultivation than in the wild. Miss Preston in Ottawa has had it for two years and it has flowered but not increased at all there. It is doing well in Washington, D. C. I have had it one season and it wintered well and flowered the first year. It is strange that this exquisite Lily has not made more of a stir in our gardens. It should be watered until after it has flowered.

L. MARITIMUM KELLOGG

The Maritime Lily

Habitat. From the swamps in bleak, fog-swept meadows near the coast in central California, also in Mendocino County, northern California, from sea level to 300 feet. Mr. Purdy says it grows along the sea beaches above the tide water facing the ocean in sticky clay subsoil and peaty topsoil or in deeper soil of ocean sand mixed with humus and amongst ericaceous shrubs.

Description. A small maritime Lily whose stem rises from a cluster of leaves near the base, with flowers facing outward and colored deep crimson with orange throats and dark purple spots. The leaves are narrowly oblong and three-nerved.

There are usually 1 to 3 but sometimes 5 flowers. They are small, about 1 inch across, revolute above the middle.

Season of Bloom. May to August.

Bulb. Isolated, conic, pure white, 1 to 1½ inches in diameter.

Depth of Planting. Not very deep, about 2 inches below the surface.

Culture. Mr. Purdy says it needs moisture under the bulb and not above it. In Washington, D. C., it is grown in loamy, slightly alkaline sand in partial shade, and it flowered the first summer. It is rare.

L. OCCIDENTALIS PURDY

The Western Lily

Habitat. It is found in northwestern California under exactly the same conditions as those in which maritimum grows, which it replaces from the Eel River north to the Oregon line near Crescent City, California.

Description. At its best it is 5 to 6 feet high with dark green foliage mostly in whorls and a dozen or so nodding revolute flowers varying from a medium to a dark glowing crimson. The stem is slender from 3 feet to as high as 6 feet. The leaves are dark green, acute, scattered, but generally with three whorls in the center. The flower is much like pardalinum. The inflorescence is somewhat verticillate. The flower is 1½ to 2½ inches long, and is orange red at the base turning red at the tips with a maroon-spotted throat.

Bulb. Small on a branching rhizome exactly like that of maritimum. It has large few jointed scales and never forms clumps.

Culture. I have not heard of it in cultivation nor seen it in any catalog.

L. PARDALINUM KELLOGG

The Leopard Lily

Habitat. In California from the Mexican border to the north of the state, from sea level to 5000 feet. In the northern coast ranges it is likely to grow along the banks of a small stream where its roots run down to the water. It grows in damp meadows in the high mountains and in gravelly soils where a spring seeps one or two feet down. It glories in sunshine and exposed places.

Description. A graceful, bright green stem with whorls of pointed somewhat floppy leaves, carries a pyramid of nodding orange flowers on long curving pedicels, with segments rolled way back and usually marked with yellow circles and brown spots like a leopard's. The stem is smooth and hollow, light yellowish green and tapering, 3 to 7 feet high. The leaves are a bright yellow-green darker than the stem and are slender and narrowly lanceolate, generally in three or four whorls of 9 to 15 leaves with a few scattered above and below, but sometimes they are all scattered. There are from 3 to 30 flowers. The segments bend back so far that they touch the stem. The flowers are 1¾ to 2½ inches across and have a greenish heart, not star-shaped as in superbum. The pistil is pale green and the stamens, like cool green jade, flare way out from all this blazing red and orange. The reddish anthers covered with golden orange pollen loosely swing from the filaments.

Season of Bloom. End of June, first half of July.

Bulb. A rhizome made of a fleshy root stock covered with overlapping brittle scales, 1, 2, or 3 jointed, and forms flat mat-like masses of rounded oblate bulbs. Each of these bulbs may produce from 1 to 5 new buds a year and each bud sends up a flowering stalk. The bulbs on the outside of the clumps are more sturdy and vigorous and those on the inside more compressed and starved. The older rhizomes become yellow and the newer ones are white.

Depth of Planting. Only a few inches below the surface.

Increase. It can be raised from seeds, but when the bulb forms mats so quickly all one has to do is to slice off a piece of the rhizome with adhering scales and plant it in the garden. Mr. Purdy once found 500 growing on a single clump. How I envy him leaning over that swaying mass and counting their vampish blooms!

Culture. Mr. Purdy says it will grow in land suitable for potatoes and in stiff clay loam. If growing amongst shrubs it is slenderer and has poorer flowers but can stand some shade. It grows in places which are very wet at certain times of the year (like canadense and superbum). In Washington, D. C., it thrives in both sun and partial shade. There in one garden, where it also set seed, twenty stalks were formed from four bulbs in three years. There it grows in sandy loam amongst perennials. It is being grown at the Harvard Botanical Garden, on Cape Cod, and in Peekskill. It is a handsome hardy Lily for the flower border or for naturalizing and one of the few American species fond of the sun. It must have moisture at its feet until after it has flowered.

Hybrid. Pardalinum Parryi — called Pardal-Parryi.

The type varies enormously and has probably crossed in the wild with several species.

Var. angustifolium has narrow, scattered, slender leaves, and the whole plant is *smaller than the type*, the stem being 18 inches to 2 feet high and the flower 3 inches across.

Var. minor. Sometimes called Lilium parviflorum.

Habitat. In southern Sierras at an altitude of 3000 to 5000 feet and as far north as the base of Mt. Shasta (northern California).

Description. Rhizomes seldom branch and therefore seldom form masses and rarely produce more than two eyes, is a solitary Lily and has jointed scales. The stem is 2 to 3 feet high, sometimes 6 feet. There are sometimes 20 flowers, and the color varies, the inner third of segments is lightly dotted and it is always fairly fragrant. Always has some orange at center and some red on outer sections. Blooms earlier than type.

Culture. I do not know of anyone growing it, but its fragrance is attractive. In the wild it grows amongst tall perennials and low shrubs which it overtops. So it is sun loving.

Var. warei. The lost Lily was an unspotted, clear, yellow, revolute, fragrant flower. It was sent to England years ago but has never been found again.

Var. luteum. With yellow flowers spotted brownish purple.

L. PARRYI WATSON

Lemon Lily, Parry's Lily (by Elwes)

Habitat. Found high up in the mountains in an altitude of from 5500 to 9000 feet in southern California and Arizona in moist, shaded spots in cool canyons along the margins of brooks in sandy, mossy soil.

Description. A lovely Lily with large fragrant light yellow funnel-form blossoms, slightly flaring from the base with tips curving back a little and light green leaves. The stem is usually 1 to 2 feet tall but in cultivation it grows as high as 5 feet. It is smooth and slender. The leaves are lanceolate, sometimes scattered, in whorls towards the center of the stem. The flowers are from a few to 15 in number, large pale lemon yellow, sometimes without dots but at others with small purple ones at the base. They are horizontally disposed and close together on short pedicels. They are delightfully fragrant.

Season of Bloom. May to August.

Bulb. Somewhat rhizomatous, 1½ inches long, has three or more jointed scales and never produces more than one new eye and is therefore solitary.

Increase. Needs moisture to form seeds.

Culture. It should be planted early in the season. Pringle says, "It needs water for its roots and shelter from the scalding sun and that is why it grows along mountain brooks in arid regions." It has been in a garden in Washington, D. C., three years in partial shade and flowered the first year. It does well in Medina, N. Y., in leaf mold and sandy loam and has produced fertile seeds, but requires a little protection there. It came through its first winter in my Peekskill garden. Not an easy Lily.

Hybrid. Parryi-humboldtii magnificum.

L. PARVUM KELLOGG

Little Yellow Lily

Small Flowered Rocky Mountain Lily

Habitat. This is an Alpine Lily and grows in high altitudes up to 10,000 feet and never below 6000 feet. It is found around Lake Tahoe, near Mirror Lake in Yosemite Valley, also in the Sequoias in northern California and in Nevada. It grows in open places in the forest in damp granite soils often where there is an underbrush of Ceanothus or Castanopsis. Mr. Purdy says it is happiest in sharp soil where the roots can reach abundant water while the bulb is in perfectly drained soil where it is always moist and never wet.

Description. A pretty plant with small ascending cuplike flowers with their segments pointed at the tips and turning out enough to present a starry orange face. Some of the wild plants are tall and vigorous. The stem tapers, and is generally 2 feet high but occasionally much taller and covered with a slight bloom. The leaves curl up at edges, and are small and stiffly whorled or scattered, not crowded in whorls. The flowers are in a loose raceme usually 6 to 9 but sometimes as many as 30, on pedicels subtended by a tiny leaf. They are erect or ascending, 1¼ inches long and the same across. Below the red tip of the segments the cup is orange dotted with purplish brown. The back of the flower is orange red with a greenish tinge along the base. It varies little. The seed capsule is round and small.

Season of Bloom. Late June, July, and early August.

Bulb. Creamy, short rhizomatous, very small, ½ inch across with many jointed, tiny brittle scales.

Depth of Planting. Not very deep, for the bulbs form matlike clumps.

Increase. I presume from seeds or bulb scales.

Culture. At the Harvard Botanical Garden in the "bog" where it flowered on June 8th. I think this is the wrong place for it. They are also growing the var. luteum there. It is grown at the New York Botanical Garden and in a garden at Washington, D. C., in partial shade in poor, loamy soil, where it flowered the first year. It came through the winter one hundred per cent for me in dry soil in partial shade and some of the plants had flowers. One of the easy Lilies to grow.

Var. luteum Hort. Found in same locality as type.

Clear orange, spotted with small brown spots and tipped with red, with orange anthers and segments revolute from base.

L. ROEZLII REGEL *

Roezl's Lily

Habitat. It was discovered at an early date and then lost and reintroduced by Mr. Purdy. It is found in the Siskiyou Range or in California at an altitude of 3000 to 5000 feet usually in the same kind of soil as pardalinum, occasionally in bogs of pure peat, and in humus so wet as to be muck.

Description. "The loveliest of Lilies," orange red with segments turned slightly back and rolled under on a slender stem with pale, long, slim, crowded leaves. The stem is 2 to 5 feet high, a few of the leaves are in whorls. The flowers are few in number and at most 12 to a stalk. They are closely revolute and finely dotted on the inner one-third of the segments.

Season of Bloom. June, July.

Bulb. It has little tendency to form clumps and has solitary rhizomatous roots with 3 or 4 jointed scales.

Stem Roots. No stem roots.

Depth of Planting. Shallow.

Increase. Presumably from seeds and bulb scales.

Culture. I have not seen the plant, but it sounds worth a trial and from my own experience with California Lilies it ought to do well in partial shade. It is being grown in Washington, D. C. It does well in sandy loam in Mr. Purdy's garden and he says it should be massed to give the best effect. Mr. Purdy, who knows the Lilies well, thinks this is a distinct kind.

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* Taken from Purdy.

L. RUBESCENS WATSON

Chaparral Lily, Redwood Lily, Lilac Lily, the Lily of the Sierras

Habitat. From San Francisco Bay north to Humboldt County (northwest California) and back of the coast for fifty miles. In the Redwood Forest it is known as the Redwood Lily. It is found under trees and grows amongst Chaparral. It is best in the high, bushy mountains near Ukiah (northwest California).

Description. The stem is stout, light green with purplish tinge near the base, tapering 3 to 7 feet high in the wild (very small in my garden). The leaves are whorled as many as 17 in a whorl, have rippled edges, and grow smaller as they ascend. The flowers are 1½ to 2 inches long and from 1 to as many as 30 on a stem in a loose raceme if many and an umbel if a few. They are erect or ascending and tubular, the tips of the segments turning out and back. The *segments overlap and the trumpet is narrow.* These characteristics distinguish it from the L. washingtonianum. The pedicels and buds are oblique to the stem, the flowers open pale lilac, becoming rose purple, with fine, uneven pansy purple dots in the center of segments, which quickly spread until they color the whole flower wine purple. The anthers are yellow and the pistil pale green. It is delightfully fragrant, more so than washingtonianum. It is exquisite and worth exercising all one's skill to establish.

Season of Bloom. June, July.

Bulb. Somewhat rhizomatous, oblique, 1⅝ inches to 2½ inches long with loose pointed fleshy scales. The stem rises from the side and tough fibrous roots come from its base.

Culture. It should be collected in mid-October or the bulb will be hard to handle. Mr. Purdy says it is a better garden

Lily than either form of washingtonianum and smaller, and that it needs sharp drainage and the ground shelter of some undergrowth. It is growing in partial shade in Washington, D. C., and has been there two years and also at the Harvard Botanical Garden, where it is being grown in the "bog." Seven of the twelve which I planted last fall in half shade came up without flower buds. Not an easy Lily to grow.

L. WASHINGTONIANUM KELLOGG

The Washington Lily

The miners knew it and called it "The Lady Washington Lily."

Habitat. From Oregon to south central California in an altitude of 3800 to 6200 feet in open forests but oftenest in low shrubby undergrowth, sometimes of wild Cherry (if this grows too tall the Lily dies out), always on slightly shaded slopes of ridges where there is porous soil and gravelly subsoil such as the dry woods of Mt. Shasta in Oregon. Perfect drainage is always present. A heavy covering of snow keeps the ground wet all through the winter and until it has all melted in the spring.

Description. The stem is smooth, stout, purplish, 2 to 5 feet high. The leaves have rippling margins and are shiny. The blossoms are white, remaining white, and are from 2 to 20 to a stem. The segments are cleft at the base and spread wide apart as the flower opens. It has a delicious scent.

Depth of Planting. Very deep, from 8 to 20 inches.

Stem Roots. There are some and the base roots form rather slowly.

Bulb. Described under var. purpureum.

Culture. Mr. Purdy told me that the next year after a forest fire had burned the underbrush away they were at their best, showing that they do not like crowding and perhaps that they like potash. He says they grew luxuriantly in a plowed field which had not been plowed deeply enough to reach the bulbs. Also that there is a strong tendency for the collected bulb to go into soft rot. The type is not vigorous nor easy to grow and as the difference from the hardier variety purpureum is only slight it is better to order the variety. Dr. Kellogg, in 1857, wrote that the bulbs had been in cultivation for four years in California and that they should be kept in the shade.

L. WASHINGTONIANUM VAR. PURPUREUM *

Known as the "White Lily" in some localities and also called the "Mt. Hood Lily."

Habitat. Found about Mt. Hood (northwest Oregon) and on the northern border of California, not only in high altitudes but as low as 600 feet.

Description. A strong-growing Lily in the wild and one of our finest, for the unusual color behavior of the flowers. They open white with purple dots which spread slowly over the whole surface, flushing the older flowers a deep purple. The stems are fairly high and storied with as many as ten whorls of leaves. They rise from one end of the bulb and are somewhat rough but without hairs, slender, tapering, and from 3 to 7 feet high. The leaves are long, terminating in a rounded tip and are undulate, smooth, and shiny. The upward-reaching flowers open their tips way out and send forth an enticing scent. There are from a few to thirty flowers, the inflorescence is in a raceme. The flowers start in a tube for the first two-thirds of their length and then turn out and back. The segments have a slender claw deeply channeled and are so narrow that there

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* As practically all of the washingtonianums in cultivation are of this variety, I will presume that the reports I received were about this Lily.

is a space of fully half their width between them. This distinguishes them from rubescens, whose segments overlap.

Season of Bloom. Middle of June to September.

Bulb. Oblique with long, narrow scales. Sometimes they are very large, heavy and compact. The new scales form at one end only and gradually decay at the other.

Depth of Planting. Very deep.

Increase. Mr. Purdy says the bulb scales readily make little bulbs and in the sawdust used for packing in the fall, the following spring, he frequently finds lots of perfect little bulbs formed from the scales. This Lily was raised from seed in New Zealand, where it seems to thrive.

Culture. The California bulb is likely to decay, but the Oregon one is very easy to handle. In Mr. Purdy's garden it luxuriates in all but the wettest ground. It has flowered for two successive years in Washington, D. C., and is growing now at the Harvard Botanical Garden and out in Granite Falls, Washington. I have had two bulbs of it in the sunny border for three years, which proves it can endure our winters. Mine have blossomed but are not husky. Perhaps they would improve if moved into the half shade where they belong. They are mulched with straw in the winter.

L. WASHINGTONIANUM VAR. MINOR

The Shasta Lily

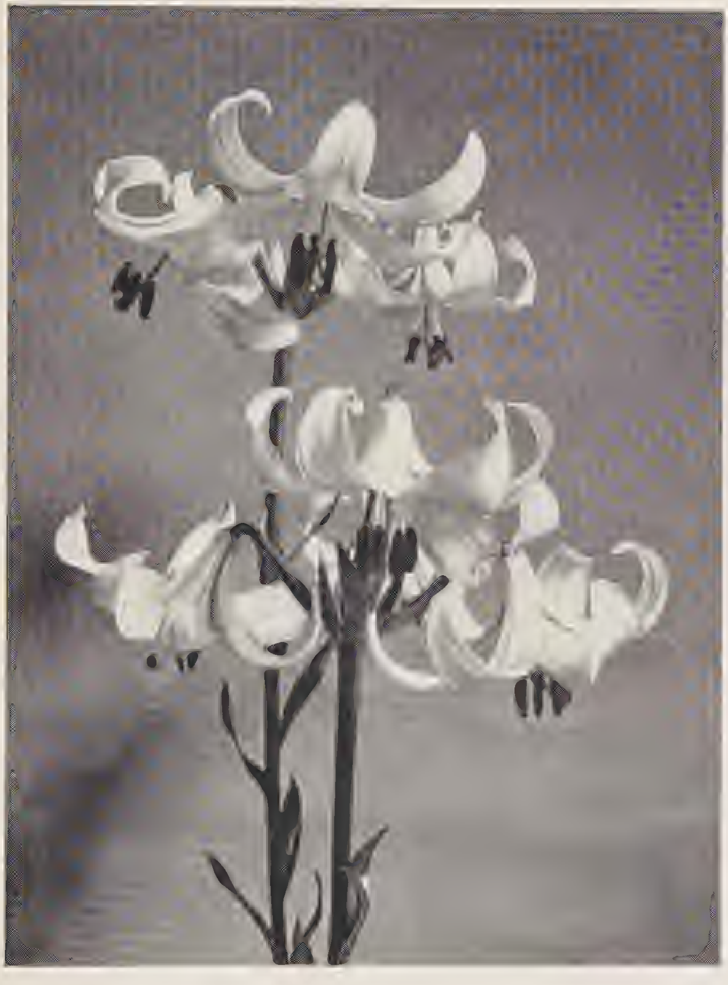
Found around the base of Mt. Shasta in California at an altitude of 3500 to 6000 feet for about fifty miles, with flowers and stalks like the type but with little bulbs usually of about two ounces in weight and seldom growing over four feet high. It bears from one to twelve flowers with segments rather broader than in type and in other points it is as in type and has the space between the segments.

CHAPTER XI

EUROPEAN LILIES

- bulbiferum }
- croceum } sun — numerous varieties of garden origin,
- candidum — sun,
  - var. aureomarginatum,
  - var. florepleno,
- chalcedonicum — sun,
- carniolicum — semi-shade,
- martagon — a little shade,
  - var. album,
  - var. glabrum,
  - var. dalmaticum,
  - var. cattanniae,
- monadelphum — semi-shade,
  - var. szovitzianum,
  - var. ponticum,
- pomponium — sun,
- pyrenaicum — sun,
- testaceum — sun.

THERE are nine species of European Lilies and a tenth, L. testaceum, a foundling, whose ancestry is shrouded in mystery. The whole group are hardy and perfectly at home in America. All are obtainable here except carniolicum and the type of monadelphum, which last is no deprivation as we



L. testaceum.

are told its variety szovitzianum is the one to grow.

At present the only difficulty connected with them is that most of the bulbs are imported and often arrive in poor condition after their long journey across the sea. A few varieties are raised here and when these are procurable they are absolutely fool-proof.

The bulbs of the European Lilies look vigorous and are perennial with many fleshy overlapping scales, generally long and pointed and firmly attached to the base.

In England, where these Lilies have been raised from seed, they were found to take from six to seven years to reach the flowering stage, an almost impossible obstacle to American gardeners, for who of us stays in one place as long as that? My experience with their seeds has only been with those of martagon, croceum, and candidum. The candidums after I hand-pollinated them produced a plump-looking capsule, but only a few of the seeds were fertile and these, too, took an unconscionable time to flower. We can circumvent their unwillingness to seed and slow growth from seed by planting the bulb scales or by following Dr. Griffiths' directions for both candidums and testaceums and bury their stems in sand as described under "May They Increase and Multiply." These bulblets flower in three years or so and when the family prepares to move, boxes of the precious little bulbs can be packed along with the Lares and Penates.

Testaceums increase considerably from bulbs. Some of these had become diseased in my garden, so I dug them all up, or thought I had, but evidently one scale remained behind, and three years later I was surprised to greet an unexpected but most welcome guest when a tall testaceum showed its creamy head behind a clump of Anchusas. Their stems and leaves look so like candidums that I had not recognized it while it was growing up.

Seven out of these ten Lilies prefer a sunny situation and are therefore a delight to the gardener who uses their spire-like stems to give height to his planting.

As the summer goes by I often think this or that Lily is the loveliest, but at the end of the season, when I indulge in fond reminiscences to cheer me during the bleak winter days, the fragrant candidum with its glistening perianth seems to have gathered the graces of all the Lilies unto itself. They have been the favorites right through the ages. After a glorious classic past their charm continued to win popularity for them, and we find that the Renaissance artists often painted the candidums in their pictures. They were placed near the Virgin and St. Joseph is shown carrying a stem of the flowers, and so is the

L. martagon album at Foxden.

Angel Gabriel, and it was the blossom sacred to St. John the Baptist, St. Francis, and St. Anthony of Padua. The Spaniards, I have been told, brought it to America and planted it in their mission gardens in Mexico and California, where it has flourished ever since.

In our modern days, in the Paris markets great bunches of this ancient Lily are sold in late June, and in the country from every little peasant garden their snowy bells ring out above the Roses and Carnations.

The croceums and their relations are popular, too, and can be bought in pots for a few cents in the open squares of the provincial French cities on flower market days. They are as frequent in the European gardens as Hollyhocks and Phlox in ours. Since they are so vigorous and easily increased they are sure to overrun our gardens in a short time too.

When ordering Lilies classified under elegans, thunbergianum, or umbellatum from a catalog, the gardener is overwhelmed by the length of the list and complication of names. Only a few are described and these sound hopelessly alike and there is no clearly arranged list of them in Bailey's "Standard Cyclopedia of Horticulture" or in "Standardized Plant Names" to turn to for reference. Some day all of them will have to be assembled under one roof and a committee of experts invited to cull out the duplicates, and decide upon those which are worthy of a varietal standing of their own. From a remote period the Japanese have grown several kinds of "elegans," Lilies now classed as varieties of L. davuricum by Mr. E. H. Wilson. Undoubtedly when these were brought to Europe they were crossed with the similar European bulbiferum and croceum or with descendants of these two. We know that this is very easy to do. These varieties have produced a legion of offspring, some of them with strong family resemblances and others quite distinct. Each grower proudly gave his creation a name and that accounts for the long and mixed-up list now before the public.

I have included three of the Japanese Lilies in the same list with the Europeans of this type because they are so alike both culturally and æsthetically. They all have upright flowers. Some are quite dwarf, as short as ten inches, bearing two or three flowers, and others are two or three feet tall. One of these with a fasciated stem now has sixty-five buds on it (I just counted them) in the garden.

They take their colors from the yellow-red end of the spectrum beginning with soft apricot and a faded orange and going through the scale until they come to a rich dark red. Often the depth of the red is brought out by an orange patch in the center

L. croceum and purple petunias at Foxden.

of the segments. Some of these are sterile, but the majority bear fertile seed which produces flowers after two or at most three years of waiting. The great danger now is that some ugly offspring with blotched or faded colors may result from these willingly mated parents. When these disfigured flowers appear they should be destroyed as certain tribes in the Caucasus famed for their beauty used to do with the malformed babies, so as not to lower the standard of beauty.

The European Lilies have benefited from being cherished in well-groomed gardens for generations and have become finer specimens than their wild ancestors struggling for a foothold in the hills and fields ever were.

They are not possessed of strong stem roots. The small bulbs should be planted shallower and the large ones deeper, for the small ones dig themselves down as they grow. The rule of planting the bulb three times as deep as the bulb is high (that is, to have four inches of soil cover a bulb two inches high) gives good results, with the exception of candidum, which should only have one-half or one inch of soil above the top of its bulb.

Pomponium, pyrenaicum, chalcedonicum, and carniolicum are closely related and it is difficult to picture their differences from written descriptions. They are distinguishable from each other in their carriage, the character of their leaves, and the color of the flowers.

The Asiatic hansonii blooms at the same time as the martagon and is similar to it except for its yellow, thicker, and coarser flowers. It is not surprising that they have been crossed. These crosses are the Backhouse Hybrids, which sound lovely, but as I only saw them after they had finished blooming, I cannot describe them as an eyewitness.

When I do not say anything about "increase" in the following pages it is because I do not know. One can always multiply the stock by planting the bulb scales.

L. BULBIFERUM LINNAEUS

The bulbiferous Lily

Habitat. Apennines, the Tyrol, Maritime Alps, the Grisons, southern Germany, in rocky and wooded places, in mountain regions, in subalpine meadows, at an altitude of 1000 to 4000 feet.

Description. As I have never seen the Lily, I will quote Wallace's description. He says it is "A tall growing Lily from 3 to 4 feet high, with crowded large dark green lanceolate foliage, bearing *bulblets in the axils* and having an umbel of large, broad-petaled, cup-shaped flowers of a rich cherry red color, having an orange blotch and a few black spots in the center." The stem is 2 to 4 feet high in cultivation. Parkinson, in his "Paradisi in Sole," says of this Lily, "the green heads for flowers will have a kind of wollinesse on them before the flowers begin to open . . . amongst the uppermost leaves appear small bulbs or heads which being ripe if they are put into the ground or if they fall of themselves will shoot forth leaves and beare flowers within two or three years like the mother plant. . . . This Lily will shoote strings under the ground . . . whereat will grow white bulbed roots like the rootes of the mother plant thereby quickly increasing itself."

Season of Bloom. June, July.

Bulb. White solitary, with thick, broad scales terminating in a point. Sometimes it has a creeping underground stem, "the strings under the ground," which disappears in cultivation.

Depth of Planting. To a depth of three times the height of the bulb.

Stem Roots. According to the picture in Elwes' monograph, it has some.

Increase. It can be raised from the bulbils which produce flowers in two or three years after planting.

Culture. Easy to grow and in America has been grown, that I know of, in Washington and in Charlotte, Vermont, where Mr. Horsford has had it in flower in three years from bulbils.

L. CROCEUM CHAIX.

The orange Lily

In the north of Ireland, on account of its name and color, it has become a political emblem.

Habitat. Savoy, hills of Tuscany, Maritime Alps, the Grisons, and the Island of Corsica.

Description. A radiant orange Lily like concentrated sunshine, with 4 to 6 chalice-like flowers disposed in an umbel borne on a hairy leafy stem about 3 feet high. The back of the flower and the buds are woolly.

Season of Bloom, Late June, July.

Bulb. Large, globose, white, firm, with scale so closely overlapping as to seem solid, 2½ inches wide and 1½ inches high. It is said to have a creeping underground stem so that the bulbs do not always come up where they were planted, but this has not happened in my garden.

Stem Roots. Has stem roots.

Increase. Seed capsules ripen the end of September, beginning of October. It bears fertile seed which is easily raised. The bulbs increase by doubling and tripling and should be divided when this occurs.

Culture. A hardy Lily flourishing in the sunny border. It has kept well in my garden. It is grown in most parts of the United States and is hardy at Ottawa.

VARIETIES OF CROCEUM, BULBIFERUM, AND ELEGANS

Some of these are of Japanese origin, but are like the European ones in culture and appearance, so that I have put them all on one list, selected for beauty, from the American catalogs:

var. alice wilson. Dwarf with clear lemon yellow flowers sparsely spotted with black.

var. alutaceum. Dwarf with apricot-colored flowers copiously spotted with small purple black dots.

var. atrosanguineum. Stem two feet tall, the flowers rich dark crimson with black spots and frilled edges to the segments.

var. leonard joerg. Mr. Marshall thinks this is one of the most attractive of the lot and says it is a fine shade of apricot with dark spots.

var. elegans var. incomparabile. Deep red, very strong grower, flowers sometimes in two-storied whorls, stem 12 to 24 inches high.

var. peter barr. An immense flower of pure yellow.

var. horsmanni. The flowers of richest crimson.

var. wallacei. This Lily has a stoloniferous stem. The flowers are reddish orange sparingly spotted. It is of garden origin in Japan. It is very like the others in coloring and shape and when sold as a distinct species arouses false expectations of something different.

var. batemanniae. Is of Japanese origin and of a lovely peach color but is subject to disease.

var. elegans var. thunbergianum. Of Japanese origin, the flowers are pale scarlet, deep velvety crimson inside and have a golden luster outside.

Increase. As most of these are hybrids, the seeds will not always come true.

Culture. They are all extremely hardy except perhaps var. batemanniae. They like the sunny border and should be planted three times the depth of the height of the bulb.

L. CANDIDUM Linnaeus *

Called the white Lily, the Annunciation Lily, the Bourbon Lily, the June Lily.

Habitat. Southeastern Europe from Corsica to Greece, Turkey, Persia, and as far east as the Caucasus.

Description. It has a delicious fragrance. It grows basal leaves from the bulb in the autumn. The pale green stems are about 4½ feet high, smooth and round, sometimes marked purplish, and grow paler to almost white at the top. The white flowers sparkle like sun shining on snow and are shaped like widely flaring bells swinging at right angles to the stem. The anthers are yellow, covered with pale golden pollen, the style is white and the stigma greenish.

* My description is from the candidums growing in my garden.

Season of Bloom. June, early July.

Bulb. 4 inches across and 2½ inches high, white with a yellowish tinge on the tips of the scales which are strong, fleshy, and firmly attached.

Depth of Planting. This is the outstanding example of a shallow-growing Lily and should be planted from one-half to one inch from the top of the bulb to the surface of the ground.

Increase. It forms seeds but these are not highly fertile. Cut off the stem about 18 inches above the ground after flowering and bulblets will form along it which can later be picked off and planted and will produce flowers in a few years. Bulblets sometimes form on the flowering stem just where it joins the bulb. Propagation through bulb scales is satisfactory and Dr. Griffiths' method of burying the flower stem can also be practiced.

Culture. Transplant five weeks after flowering, late in August or early in September. Give them plenty of room in a sunny bed with a low growth of filmy flowers about their feet. Candidum is absolutely hardy and grows throughout the United States and even in Mexico. It does marvelously in California around San Francisco where the bulbs double up amazingly and have to be separated. In Ottawa, Miss Preston reports that the early spring winds frequently damage the flowers. It is sometimes subject to a disease which is easy to control by spraying with Bordeaux. It does not always bloom the first year after transplanting. The mice do not eat the bulbs

The following varieties were taken from Elwes:

var. aureo-marginatum. Its leaves are edged with yellow.

var. florepleno. Said to have come from Constantinople, and is a double variety.

Mr. Scheepers says the kind to buy are the ones coming from northern France, which have bulbs of white fleshy scales, and that those grown in southern France have pink scales and are not so good.

We can now buy splendid bulbs raised in America.

Hybrid. It has been crossed with testaceum.

L. CARNIOLICUM BERNH.

Called the Carniolian Lily by Elwes and the "Bright Red Lily of Hungarie" by Parkinson.

Habitat. Istria, Herzegovina, Lombardy, occurring in pastures on a limestone foundation, at an altitude of from 1000 to 5000 feet.

Description. The plant is from 2 to 3 feet high with nodding reflexed flowers of orange yellow at times shading to scarlet, much reflexed with the lower half of the segments spotted with red brown dots sometimes raised into papillae. It has a short, stout style. In the wild there are 1 or 2 flowers but 5 or 6 in cultivation. The leaves are spoon-shaped, scattered, numerous and hairy on the veins below.

Season of Bloom. June, early July.

Bulb. Measures 1 to 2 inches in diameter.

Stem Roots. Has stem roots.

Depth of Planting. I should think three times the height of the bulb.

Culture. Elwes says it grows finely in the shade. It is not grown or sold in the United States that I know of, but from the picture in Elwes' book it looks well worth a trial.

L. CHALCEDONICUM LINNAEUS

Parkinson calls it the "Red Lily of Constantinople," and others, the "Scarlet Martagon."

Description. Parkinson says of this Lily, "The Red Martagon of Constantinople is become so common everywhere and so well knowne to all lovers of these delights that I shall seeme unto them to lose time to bestow many lines upon it." The stem is 26 inches high and has long pointed silvery leaves scattered along it growing narrower and shorter toward the top. They are hairy on the veins and along the margins. The flowers are nodding and reflexed from below the middle and are a warm coral red. There are 1 to 3 of them in the wild and as many as 10 in cultivation.

Season of Bloom. July, early August.

Bulb. Globose of orange yellowish color, 2 inches high and 3 inches wide.*

Stem Roots. Has stem roots.

Depth of Planting. I should think three times the height of the bulb.

Increase. It has set seed for an amateur gardener in Washington, D. C.

Culture. Elwes says it is one of the most brilliant and easily cultivable plants. Mr. Craig of Weymouth, Mass., has had them six feet tall and blooming amazingly from very large bulbs. In Washington, D. C., they have bloomed for three years and remained healthy to date. It bloomed the first year after planting in my garden at Peekskill. It is both hardy and beautiful.

Hybrid. It has been crossed with testaceum.

L. MARTAGON LINNAEUS

Habitat. From Spain to Sweden, Greece, Italy, and Hungary, all through central and southern Europe and into Siberia.

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* These measurements were taken from huge bulbs sent to me.

It is the commonest European species. It is found in hilly districts, in meadows, or on the borders of woods amongst long high grass as high as 7000 feet.

Description. Parkinson in his "Paradisi in Sole" describes it as follows, "Martagon Imperiale . . . Leaves set together at certain distances, round about the stalk and not sparsely. . . . Has a scaly root like unto all the rest of the Lilies but of paler yellow color, closely compact or set together, being short often times in comparison of the greatness of the stem growing from it. . . . Each flower whereof is pendulous hanging down and each leaf of the flower turning up again . . . being thicke or fleshy, or of a fine delayed purple colour spotted with many blackish or brownish spots of a very pleasant sweet sent which maketh it the more acceptable. . . ." About the roots he says, "The root is very apt to increase or set off as we call it, whereby the plant seldom cometh to so great a head of flowers but riseth up with many stalks and then carry fewer flowers." It is a muddy purple color and has an unpleasant smell.

Season of Bloom. From April in Hungary to August in France. In the United States, June and early July.

Bulb. Ovoid, scales numerous, 1½ inches high and the same across.

Depth of Planting. Not deep, about 5 inches.

Stem Roots. Practically none.

Increase. Has been raised from seeds in England which seem to mature slowly.

Culture. More vigorous in cultivation than in the wild. The martagons have been grown successfully in Washington, D. C., in partial shade, and in Granite Springs, Washington, where both the album and dalmaticum were grown, in New York and in Guelph, Canada. It is hardy, but from the muddy purple flowers I have had, I do not think the type is attractive, var. cattanniae sounds better. However, martagon album is charming and I highly recommend it.

Var. album. White with waxy flowers, shining like "glazed porcelain," greenish at the back and in their hearts, without any spots and with green stamens and pistils and pale gold pollen. The stems are 4 feet tall. They are only very slightly scented.

Culture. Partial shade amongst perennials. Mr. E. H. Wilson told me it is grown by the French Canadians. The same bulbs have been in my garden for six years and have flowered and set fertile seed which, however, did not germinate and it has not increased perceptibly. The mice do not eat the bulbs. It is the first white Lily to bloom and is so daintily graceful it belongs to a fairy world.

Var. glabrum. A slender form with white flowers and glabrous stem and leaves. There are also forms with claret and flesh-colored flowers. This is the one generally found in Switzerland.

Var. dalmaticum. Found in Dalmatia in calceolareous gravel at a height of 3000 feet. The perianth segments are exceedingly dark purple.

Var. cattanniae. From the same region but a little farther north and lighter in color.

L. MONADELPHUM M. BIEBERSTEIN

The Caucasian Lily

Habitat. Caucasus Mountains in the northern part in valleys amongst a rank growth of herbaceous plants at an altitude of from 4000 to 6000 feet.

Description. The stem is 3 to 5 feet high, clothed with numerous scattered hairy leaves which diminish in size as they climb to the top. There are about 4 flowers in the wild plants and 20 or more on cultivated ones. They are reflexed and pendulous, of light shining yellow tinged with claret red at the base and with a few red brown dots. The back of the perianth near the base is dark purple. The filaments are bright yellow and the pollen is yellow. The filaments are united at the base. The flowers have a strong scent, which is unpleasant to some people.

Season of Bloom. It blooms in June.

Bulb. Pointed with tiers of overlapping scales.

Depth of Planting. Mr. Grove says 5 inches deep for good-sized bulbs.

Increase. It has set seed for Miss Preston. Elwes says it does not show a cotyledon above the ground the first year, and that the seedlings grow very slowly.

Culture. It does not flower the first year after being moved. Miss Preston in Ottawa has it in partial shade amongst perennials, and Mr. Fray in Washington has it in semi-shade, too, and it is hardy in Vermont.

L. monadelphum var. szovitzianum. Found on the southern slopes of the Caucasus and has red brown pollen and the filaments free from the base. The flower buds are concealed by leaves until they are ready to open. It blooms three weeks earlier than the type. Miss Jekyll says the var. szovitzianum is finer than the type and the one to grow. The monadelphum is variable and some writers think the variety is not always distinct from the type.

L. POMPONIUM LINNAEUS

Called the Little Turk's Cap Lily and the Pompone Lily.

Habitat. The Maritime Alps.

Description. The pomponium has a stiff, erect stem 1½ to 2½ feet high, heavily marked with purplish brown and closely covered its whole length, except just below the flowers, with narrow pointed hairy leaves. These are longer at the base and grow smaller toward the top, forming a pyramid. The loosely arranged flowers are nodding and brilliant red, minutely spotted with black. The segments are reflexed from below the middle. Their distinguishing marks are warty papillae on the base of their perianth segments and unusually large anthers.

Season of Bloom. May to early July.

Bulb. Small, the size of a nut and ovoid.

Stem Roots. Has no stem roots.

Depth of Planting. 4 to 5 inches.

Culture. Pomponium is an old and well-known garden favorite and is much bigger in cultivation than in the wild, sometimes having a stem 3 feet high. It is grown in Granite Springs, Washington, where it flowered June 10th, and in Washington, D. C., where it has been happy in one garden in the sun for three years. It did not produce flowers the first year for me but sent up a leafy stem.

L. PYRENAICUM GOUAN

The Pyrenean Lily (L. jankae is the same Lily)

Habitat. The high regions of the Pyrenees on both sides of the range and in Bosnia and Transylvania.

Description. A stiff-leaved plant with smallish flowers. The thick, angular, erect stem is from 2 to 4 feet high with narrow finely hairy leaves thickly scattered along it. The flowers are pendulous, 1 to 6 in the wild, and up to 12 in cultivation. They are greenish yellow, revolute, and waxy. The pollen is brilliant scarlet, a perfect foil for the greenish yellow perianth with its tiny black raised dots. It has a smell (not fragrance) like that of martagon, which is unpleasant but is not strong.

Season of Bloom. June, July.

Bulb. Large roundish, 1½ inches across and 1 inch high.

Stem Roots. Has stem roots.

Depth of Planting. About 5 inches.

Culture. Absolutely hardy. It is an insignificant flower without charm and not worth growing. It has proven itself hardy in Washington, D. C., in Granite Springs, Washington, and in Peekskill, where I have had it three years. It did not flower the first year after planting.

L. TESTACEUM LINDLEY

Lilium excelsum, L. isabellinum, the Nankeen Lily

This Lily first appeared in 1836 in a garden. Its origin is obscure, and it is supposed to be a hybrid between candidum and monadelphum.

Description. An exquisite willowy Lily, smelling faintly like the candidum. The tall forward-bending stem is green with a grayish bloom and from 4 to 6 feet high. The leaves are scattered and closely appressed, diminishing in size toward the top of the stem. There are from 3 to 10 flowers, 2 to 3 inches across. They are nodding with reflexed waxy glistening segments, rounded at the tips and of a creamy peach color with peach-colored papillae thickest toward the center of the flower. The pistil is greenish and the anthers covered with orange pollen.

Season of Bloom. June, early July.

Bulb. Large globose, cream colored.

Depth of Planting. 5 inches or so.

Stem Roots. None, or insignificant ones.

Increase. Testaceum forms clumps from the bulbs. The flowers are self-sterile, but have been pollenized with pollen from candidum and chalcedonicum by Miss Preston. The Lily can also be increased by burying the flowering stem, as Dr. Griffiths has shown, and from bulb scales.

Culture. It is exceedingly hardy and frost resistant, one of the finest Lilies, and is grown widely in the United States and Canada from Washington to Guelph and in Vermont, Rhode Island, Long Island, New Jersey, Washington, D. C., and Peekskill. It has flowered from the same bulbs and increased for six years in my garden and evidently "bulbs à la testaceum" is not on the mice's menu. Last year the stems and leaves showed signs of a disease which has been controlled by spraying with Bordeaux.

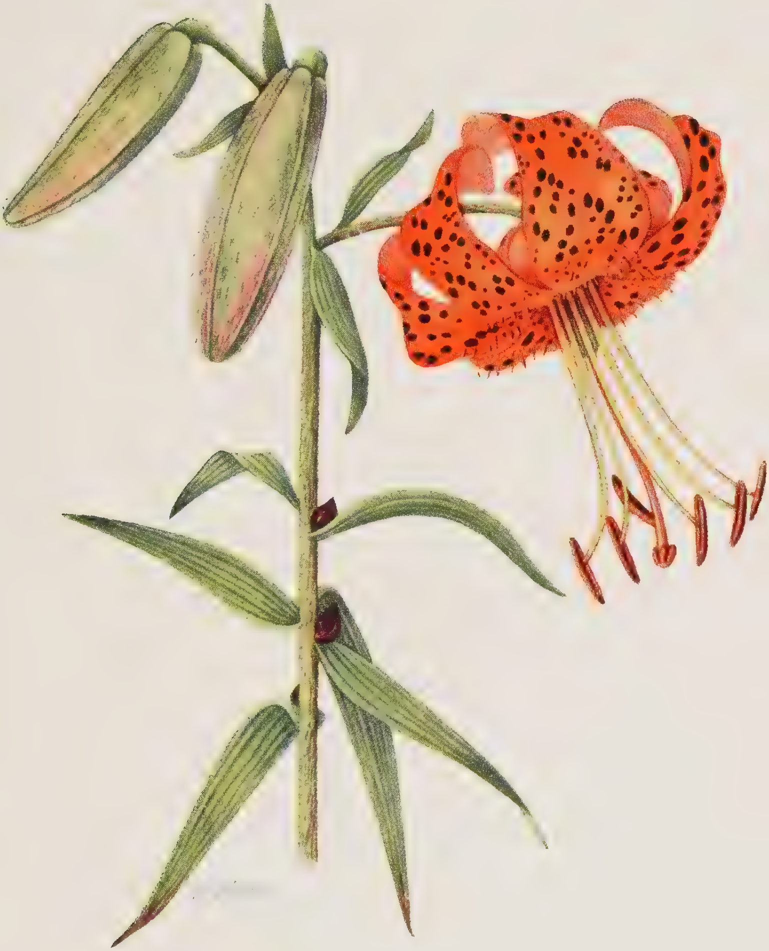
Hybrid. It has been crossed with chalcedonicum.

CHAPTER XII

ASIATIC LILIES

amabile — a little shade,
auratum — sun,
  var. platyphyllum,
  var. virginale,
  var. rubro vittatum,
  var. rubrum,
bakerianum — sun,
  var. delavayi,
brownii — shelter but not shade,
  var. colchesteri — sun,
callosum — sun,
cathayanum — not in cultivation,
cernuum — sun,
  var. candidum,
concolor — sun,
  var. pulchellum,
  var. sinicum,
cordifolium — shade,
davidii — sun,
davuricum — sun,
distichum — damp shade, not in cultivation
duchartrei — partial shade,
fargesii — not in cultivation,
giganteum — partial shade,
  var. yunnanense,

hansonii — a little shade,
henryi — a little shade,
hyacinthinum — sun,
japonicum — a little shade,
  var. album,
  var. albomarginatum,
langkongense — sun, not in cultivation in the U. S.,
leichtlinii — a little shade,
  var. maximowiczii,
leucanthum — shelter but not shade,
  var. chloraster,
longiflorum — sun,
  var. eximium,
  var. insulare,
  var. takesima,
  and others,
lophophorum — not in cultivation,
macrophyllum — not in cultivation,
medeoloides — slight shade or sun,
myriophyllum — sun, not in cultivation,
  var. superbum, is in cultivation,
neilgherrense — sun,
nepalense — not in cultivation,
ochraceum — sun,
  var. primulinum,
papilliferum — not in cultivation.
philippinense — sun,
  var. formosanum,
polyphyllum — partial shade — not in cultivation in the U. S.,
regale — sun,
rubellum — sun,
sargentiae — sun,



L. tigrinum.

sempervivoidem — sun, not in cultivation,
speciosum — a little shade,
  var. kraetzeri,
  var. melpomene,
  var. rubrum,
  var. tametomo,
  and others,
stewartianum — sun, not in cultivation,
taliense — sun, not in cultivation,
tenuifolium — sun,
  var. golden gleam — sun,
thomsonianum — sun,
tigrinum — sun,
  var. florepleno,
  var. fortunei,
  var. splendens,
  and others,
tsingtauense — shade, not in cultivation in the U. S.,
willmottiae — slight shade,
wallichianum — sun, not in cultivation in the U. S.

THE long white trumpet-shaped Lilies swaying on slender stems and the speckled and striped bowl-shaped ones are peculiar to Asia, and are found nowhere else. Surely such extraordinary expressions of beauty must have exerted an influence on the artists who lived with them, just as the palms were the inspiration of the Egyptian columns and the dark spire-like spruces suggested the pointed gothic arches of northern Europe.

The bulbs of some of the Asiatic Lilies are creamy and so closely overlapping as to appear solid. Only one species has jointed bulb scales which are so frequently found in the American Lilies. Many of them have a creeping underground stem bearing bulblets at its nodes. These can be readily increased from the bulblets. Some of them have fleshy articulated scales which are on the whole less vigorous than the smooth ones. The shape and character of the bulb help to identify the Lily. Sometimes the only distinction between two species is a dissimilarity in the bulbs. Generally one can see at a glance whether the bulb is frail or hardy, but at times one is completely fooled.

A few of these Lilies are not uniquely Oriental in appearance and resemble their cousins in Europe and America. The martagon-flowered ones, with their shiny rolled-back segments such as tenuifolium or duchartrei, look like the martagon Lilies of Europe. The cup-shaped davuricums are not only similar to the croceum and bulbiferum in appearance but in their behavior as well.

Certain of the Asiatic Lilies are very similar and grouping them together helps one to remember them more easily. The great Lilies with heart-shaped leaves and huge tubular flowers, the giganteum, cathayanum, and cordifolium, are so closely related and distinct from the rest that they have been placed in a subgenus by the botanists.

L. tenuifolium, golden gleam raised from seed at Foxden.

The Lilies with the silvery trumpets, the regale, sargentiae, longiflorum, leucanthum, bakerianum, and myriophyllum fall into a group. Their trumpets are not restricted to snowy white but lavishly colored outside with green, purple, brown, or rose and gilded or enameled with green inside. They are a conspicuous lot, the show girls amongst the Lilies.

Another group is composed of tiny, fairy-like plants with leaves like thin blades of grass and much reflexed nodding flowers: the tenuifolium, cernuum, callosum, and fargesii.

Then there are the unusual ones with the single wheel-like whorl of leaves so admired by the Chinese, the distichum, medeoloides, and tsingtauense. In our blind enthusiasm for their more showy relatives we have passed these dainty, more subtly charming, ones by.

Tigrinum, leichtlinii, davidii, and willmottiae are four which resemble each other outwardly, but one who has raised them is aware of the dissimilarities in their dispositions and manners.

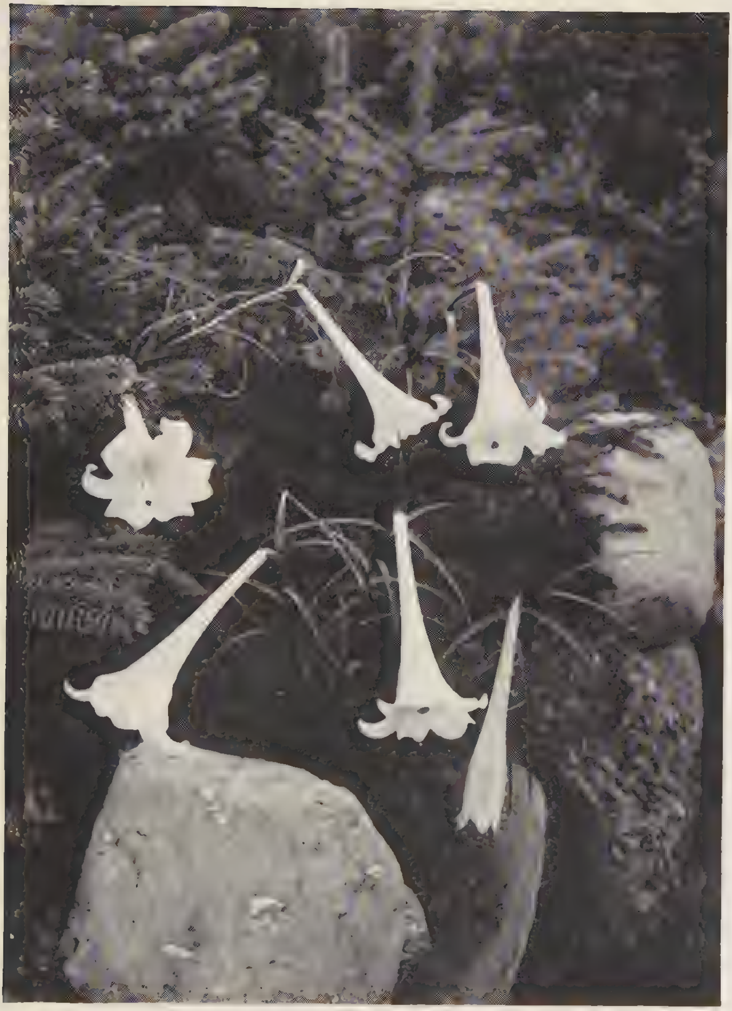
Neilgherrense and philippinense are two strange caricatures with their abnormally long narrow tubes toppling over on inadequate stems. They should be grown in semi-tropic gardens or indoors in pots in exotic rooms with modern angular furniture.

The flowers of speciosum and henryi have the same careless way of throwing out their segments as if they had been hurried at their toilet and had not the time to roll them neatly back and under.

Japonicum, rubellum, and speciosum, the three rosy Lilies of Asia, are a beautiful shade of pink without any blue or violet.

Some of the Lilies are variable and members of the same species differ greatly in the intensity of their coloring and even in the texture of their segments. This is especially noticeable amongst seedlings. I have seen sargentiae and regale shade from almost white flowers to ones deeply colored on the back and in the tube. Regale changes very much in texture also, some flowers having smooth, polished surfaces and others with decidedly rippled segments. The young plants are often much smaller and bear fewer flowers than the older ones and look quite different. These distinctions are only visible to those who have grown them and studied them, for the average visitor to the garden thinks all yellow Lilies are tiger and all white ones Easter Lilies.

The orange nodding ones are the favorites of some and the white trumpets of others. There are forty-six Asiatic species to choose from. A few names have been omitted, as there is a slight doubt about their belonging to the exclusive Lilies. Eleven of these beauties are still waiting for speaking parts in



L. philippinense in a rock garden.

our gardens and four more have appeared in England but not yet in America. No matter where your garden grows, whether it is in a cool woodland, on a sunny hillside, a rock garden, or even on a formal terrace, there are Lilies from Asia to suit each situation.

A few of these Orientals have so strong a fragrance, as the flamboyant auratum, that when working near them one is almost overpowered. But others like the well-bred tenuifolium are only faintly scented. The scent of a few can only be called "fragrance" out of politeness, for what greets our noses is a most unpleasant smell. I have noticed that in hot, dry seasons the scent is weaker and sometimes altogether lacking, and that it is stronger when it has rained a good deal and been cool.

The auratum used to be the most notorious of these Lilies, but now regale has usurped her place. Auratum lost its eminence because it is unfortunately subject to a disease which, when present, causes it to dwindle and finally disappear. It has been suggested by a desperate gardener to treat it as an annual and be satisfied with one crop of the glorious flowers. My answer to this is that it is always dangerous to introduce an infected plant into the garden. Just imagine our glow of satisfaction if we could induce anything so marvelous to come up year after year and pour all its radiance into one obscure garden.

The following is a list of Asiatic Lilies arranged in order of their flowering which are entirely hardy and healthy and will give a succession of bloom and diversity of color and shape.

Concolor, the subspecies and varieties of davuricum, tenuifolium, longiflorum (for the South and Southwest), hansonii, regale, davidii, willmottiae, tigrinum, henryi, and speciosum.

Brownii with its bronzy color scheme of green, brown, gold, and cream is stunning, but not as certain to succeed as the above, nor is sargentiae, which is subject to disease. Both of these blooming after regale continue the tubular, white-flowered type in the garden. I recommend them to anyone who is willing to take a little chance. Auratum is vigorous but cannot come onto this list until it has a better health record. Rubellum and japonicum, as I have said before, should be grown in pots as they are not hardy and are too lovely to relinquish.

The hybrids have been enumerated in the table so that the reader may know which Lilies have been proven compatible. Some of the hybrids have been lost, but in time they are likely to appear again. Lilies are so perfect that it does not seem humanly possible to improve them, but perhaps crossing them may produce some attractive new ones.

These Lilies as well as most others should be well watered until after they have flowered. They pro-

L. speciosum rubrum in the border.

duce better flowers when the ground has been kept moist but not wet.

Many of them come generously from seed and with the usual exceptions flower quicker than either the European or American species.

Some species who have led a short but a merry life die out after a few years of hectic blooming and a supply of young seedlings must be kept on hand to fill their places.

Although many of them are found growing amongst shrubs in the wild, they may have sought the shelter of the bushes for protection and not from inclination. They grow bigger and handsomer when given plenty of room in the garden and planted with low perennials and annuals which are less voracious than the hungry shrubs.

It is important to plant the sun-loving ones in the sun and to protect the shade lovers from its hot rays. I once saw some regales reduced to slim ghosts of themselves because they had been placed carefully in the shade while henryi and hansonii had a sunburn of white leprous-like spots disfiguring their complexions from being out in the hot sun.

Mr. E. H. Wilson has covered the Lilies of eastern Asia completely and except that I have approached it from a different angle it would be futile to go over it again. I refer those who wish to find out more than I have given them here to his splendid monograph.

L. AMABILE Palibin

The amiable Lily

Habitat. Korea.

Mr. Wilson says of it, "A dainty pleasing Lily of wayward habits scarcely merits its specific name. It is quite hardy and flowers annually at Holm Lea, Brookline, Mass., . . . is essentially a specialist's Lily." The leafy stem is 1 to 3 feet high and the reflexed flowers of the open martagon type are scarlet, spotted black and have an unpleasant odor.

Bulb. Is 2 inches across.

Culture. It grows in gritty, loamy, well-drained soil amongst grasses and dwarf shrubs.

L. AURATUM Lindley

The golden-rayed Lily, the golden-banded Lily, Yama-Yuri (hill Lily)

Habitat. Japan, often found in volcanic ash and lava débris.

Description. No description can do this famous beauty justice. The stem is grayish green, sometimes 8 to 10 feet high, with pointed leaves. The glorious, luxuriant flowers are bowl-shaped and turn sideways and are so heavy that the stem sways and bends under them. The great white segments have rippled margins and curl back a little at the tip, and a golden band runs through their center terminating in a glistening green nectar furrow. They exhale a strong Oriental fragrance languorous at night but too strong in the daytime or in the house for most of us.*

Season of Bloom. July, August, and early September.

Bulb. 1¾ inches wide and 2 inches across for a medium-sized one. When diseased they grow quantities of little bulbs on the inside of the scales.

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* Described from auratum in my garden.

Stem Roots. Great mats of them.

Depth of Planting. Fom 10 to 12 inches.

Increase. From bulb scales and the doubling of the bulbs. Before the hard frosts I have picked leafy stems bearing the late ripening seed capsules and allowed them to ripen indoors in a cool, dry place and planted the seeds in the spring when they germinated.

Culture. Naturally everyone wants this gorgeous flower and unfortunately it is subject to a disease. Mr. Wilson says he never saw disease on the wild bulbs. In the wild it is found growing 8 to 10 inches down in poor soil in perfect drainage amongst low shrubs. It should be grown in poor, sandy soil in a sunny situation with a low growth about the base of its stems. In the United States auratum is thriving in Seattle and Granite Springs, both in Washington, and in Massachusetts, Connecticut, Vermont, New York, Rhode Island, Pennsylvania, and Washington, D. C. In Canada, Miss Preston says it is not one of the easiest to grow and that it dies out after a few years. That has been my experience.

Many varieties are listed. I have given a few of them.

Var. platyphyllum. Also referred to as macranthum. This is the best one for the garden. The plant is shorter and has broader leaves than the type. The flowers are more massive, sometimes 12 inches across. They are creamy, with fewer pinky brown spots and have a pale gold stripe.

Var. virginale. Var. wittei is another name for this. It has a yellow band and pale yellow spots. Mr. Wilson says it is an albino form of the type and has no red in it and that it is delicate.

Var. rubro-vittatum. The golden band turns red at the tip of the segment as if it had been colored with a crayon. The margins of the segments are suffused with crimson. The large spots are highly colored and the anthers bright red. The bulb is smaller than the type and the plant less robust, but it is the one I like best.

Var. rubrum. Var. cruentum is another name for this. The central crimson band is very broad and continues to the base of the segment.

Hybrids:

Var. parkmannii, raised by Francis Parkman. Speciosum was the female parent and auratum the male. It has been lost.

Var. parkmannii var. haywardii. Had var. platyphyllum for its female parent and L. speciosum for the male.

L. BAKERIANUM Collett and Hemsley

Baker's Lily, formerly called L. lowi

Habitat. Eastern upper Burma and western China. It is found in the mountains at an elevation of 6000 feet in grassy, exposed places.

Description. A stiff, erect stem 2 feet 6 inches high with numerous scattered grass-like leaves, carries nodding bell-shaped white flowers with minute claret-brown spots and brown anthers.

Bulb. 1½ inches across and 2 inches high. The underground stem is stoloniferous.

Depth of Planting. 8 inches.

Culture. Mr. Wilson says it is not hardy in New England and that the stocks introduced into America have dwindled away.

Var. delavayi. The interior of the flower is heavily spotted with red and the apices of the perianth segments are only slightly, if at all, recurved. It comes from Yunnan.

L. BROWNII F. E. Brown

Brown's Lily, it ought to be called the Bronze Lily.

Habitat. Southern China, Hongkong, long cultivated in Holland but originally from a subtropical climate.

Description. Except that the stem is 2 to 3 feet tall suffused with rose purple which continues into the bulb, it does not seem to differ much from its variety, which I know, described below.

Season of Bloom. July, August.

Bulb. 2 inches across and 1¼ inches high.

Depth of Planting. 6 inches to 8 inches.

Culture. It has been grown in England and Holland and is hardy there. It likes shelter but not shade.

Var. colchesteri. Mr. Wilson says this is the same as odorum.

Habitat. Widely dispersed in China, in warm or temperate climates. Mr. Wilson says, "It is the common trumpet flowered Lily of China and probably grows wild in every one of the eighteen provinces of the Empire from sea level to 5000 feet altitude, according to climate."

*Description.** The stem is smooth gray-green, about 3 feet high, with leaves broadest above the middle. The flowers are about 5 inches long and tubular, and flare open and curve out a little. They are of a thick, waxy texture and are purplish brown outside. Inside they open yellow and fade to cream white the first day. The throat, however, remains gold and the purple anthers and golden brown pollen are strongly outlined against the creamy lining of the tube. It is a finely colored, handsome Lily, and has been faintly fragrant in my garden.

Increase. Even if it does not ripen seed it ought to be easily increased by bulb scales.

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* This description is from the Lily which grew in my garden.

Culture. It does not always bloom the first year. I had some bulbs for four years in the sunny border and they were healthy and vigorous but did not increase at all. They suddenly disappeared during the fifth winter. Last year some newly arrived bulbs from Japan showed signs of disease. This Lily or the type is grown in the United States in Medina, N. Y., in Washington, D. C., and in the state of Washington. All who reported on it said that it needs perfect drainage.

L. CALLOSUM SIEBOLD AND ZUCCARINI

Habitat. Eastern Asia. Mr. Wilson says it is one of the least attractive of Lilies. It is something like tenuifolium and flowers July to September.

Stem Rooting. Has stem roots.

Bulb. Siebold and Zuccarini, its discoverers, say that it is gathered in the autumn by the natives who eat it. That it is farinaceous, nourishing and agreeable to the taste, and that it is also used medicinally for chronic coughs.

Increase. Produces seed.

Culture. It can be bought in the United States, but I do not know of anyone growing it. In our search for new vegetables, we might well add these bulbs to the menu.

Var. flaviflorum is more attractive than the type and has yellow flowers.

L. CATHAYANUM WILSON

The Cathay Lily

Habitat. It comes from the mountains of central and eastern China. It is very like cordifolium. It is not in cultivation and Mr. Wilson says it is the least ornamental of its section.

L. CERNUUM KOMAROV

Habitat. Korea and Manchuria.

Description. It resembles tenuifolium. The stem is 2 feet high, the leaves numerous, grass-like, and densely crowded along the middle of the stem. The nodding flowers are lilac-spotted wine purple and are fragrant.

Bulb. White ovoid, with the scales firmly overlapping.

Depth of Planting. 3 to 5 inches.

Stem Roots. Has stem roots.

Increase. From seeds.

Culture. Mr. Wilson found it growing amongst grass and low shrubs in sunny situations and says it has to be constantly raised from seeds, and that it is a decided addition to our gardens. It can be bought in the United States.

Var. candidum. A variety with white flowers, faintly spotted with purple at the base. One solitary specimen of this was found at an elevation of 2300 feet.

L. CONCOLOR SALISBURY

The one colored Lily

Habitat. The hills of central China at an altitude of 2000 to 4000 feet.

Description. A dwarf from 6 inches to 18 inches high whose stem is tinged with purple, with slender, hairy leaves, longest toward the base of the stem. The vermilion flowers are upright and star-like. The segments have a prominent dark callose tip.

Season of Bloom. July.

Bulb. 1½ inches across. It forms a nest of bulbs when it divides.

Depth of Planting. 3 inches to 5 inches.

Stem Roots. Has many.

Increase. From seeds.

Culture. It is sun-loving and absolutely hardy and easily raised from seed. It grows and sets seed for Miss Preston in Ottawa and is grown and has set seed in Washington, D. C.

Var. pulchellum. Also called var. buschianum, has a smooth green stem, rarely tinged with purple, and glabrous leaves. The flowers are vermilion, dull scarlet, apricot, or orange red, sparingly or densely spotted, usually with a slight cottony pubescence on the buds. It is more robust than the type and also easily raised from seeds. Under "Coridion" I bought a variety with pure yellow flowers.

There are more varieties listed differing in the color of the flowers.

L. CORDIFOLIUM THUNBERG

The heart-leaved Lily

Habitat. Japan.

Description. This Lily has large heart-shaped leaves on long petioles, some of them basal. The flowers are irregularly tubular, of a dirty white spotted violet.

Season of Bloom. July.

Culture. It likes the damp forests but is sometimes found in open places. Miss Jekyll says it may be described as a poor kind of giganteum and is only interesting to the collector. The bulbs are eaten by the Ainus. It can be bought in the United States, but I do not know of its being grown here.

L. DAVIDII DUCHARTRE

David's Lily

Habitat. Western China, at an altitude of 5000 to 9000 feet.

Description. It has an erect, roughly hairy stem, 3¼ feet high and narrow, roughly hairy leaves. The flower buds are woolly and the flowers from 2 to 20 are nodding and open, with the segments spreading out and curling back. They are pinkish orange, with many black spots. The stamens and pistil curve way out. It is a charming and graceful flower like a refined and redder tigrinum.

Season of Bloom. July.

Bulb. 1½ inches across, white with many scales. It is eaten as a vegetable where it is native.

Stem Roots. A mass of them.

Depth of Planting. Three times the height of the bulb.

Increase. It flowers from seed in 2 to 3 years.

Culture. A very hardy Lily, and fond of leaf soil and good drainage and sunshine. It is grown in quantities in a garden at Lancaster, Mass., and by Mr. Craig. Miss Preston grows it in Ottawa on dry, sandy loam in the sunny border. She has crossed it with willmottiae. One would not grow both willmottiae and davidii as they look so alike, except that davidii comes later.

Hybrid. Miss Preston has crossed davidii and willmottiae and says the cross bore 60 blossoms.

L. DAVURICUM KER-GAWLER.

Habitat. Northeastern Asia.

Description. The ribbed and slightly hairy stem is 18 inches to 2 feet high. The flowers are upright, usually solitary, rarely

2 to 3 in cultivation, and red to scarlet with yellow at the base of the segments. They are frail and pale looking in comparison to their buxom, colorful offspring.

Season of Bloom. July.

Stem Roots. Has stem roots.

Bulb. The bulbs are slenderer than either croceum or bulbiferum. The stem is stoloniferous with bulblets forming along the underground stem.

Culture. Davuricum is the modest ancestor of vigorous and brilliantly colored progeny and has produced the subspecies thunbergianum and elegans, and these have mated with the European croceum and bulbiferum. Not as valuable a garden flower as its far handsomer descendants. In the United States it is grown at the Harvard Botanical Garden, the New York Botanical Garden, and in Granite Springs, Washington. Its descendants are listed under their in-laws, the croceum and bulbiferum.

L. DISTICHUM NAKAI

Habitat. Korea to northeastern Manchuria.

Description. A hollow stem with bristly hairs, slightly ribbed below the single whorl of leaves, encircling it a little above the middle. There are 3 to 6 nodding flowers with flaring segments, orange red spotted with black.

Bulb. White, narrow, 1⅛ inches high.

Stem Roots. Has stem roots.

Depth of Planting. 3 to 5 inches.

Culture. Mr. Wilson says it is a woodland Lily, fond of moisture and a cold climate plant, that "its garden value is not great, but it is a delightful little waif of the forests."

Not in cultivation.

L. DUCHARTREI FRANCHET

Duchartre's Lily. Mistakenly called L. farreri. Farrer called it the marble martagon Lily.

Habitat. Western China, in bogs and marshes at an altitude of 4000 to 11,500 feet.

Description. Farrer said of it that it "haunts cool mountain slopes and river banks amid coppice, it is a dainty Lily . . . with broader clear green leaves. The stem is 15 inches in height and carries 2 to 3 pendant martagon flowers of cold ivory, a paper white in texture, speckled rather unnecessarily with maroon along the inner margins of its segments. The flowers are larger and fatter than tenuifolium and I find it an attractive beauty as it hangs glacial and pure amid the shrub."

Season of Bloom. June, July.

Bulb. It has a creeping underground stem with bunches of bulblets at intervals along it, causing it to form colonies of plants.

Culture. Mr. Wilson says it requires a well-drained, shaded position, with abundance of water during the growing season.

It is listed by three bulb dealers in the United States, but I have no reports from anyone growing it.

L. FARGESI FRANCHET

Mr. Wilson says it will be of interest to the collector only when introduced.

L. GIGANTEUM WALLICH

The giant Lily

Habitat. Himalayas, in the high, open mountain forests, at an altitude of 5000 to 10,000 feet.

Description. From its pictures it is a stupendous, exotic-looking Lily, with great heart-shaped leaves and tubular white flowers.

Season of Bloom. Early June in England and July, early August in its native land.

Bulb. Solid bottle green color. After flowering the old bulb disappears, leaving several offsets, which may not flower for two or three years.

Stem Roots. None.

Depth of Planting. Just below the surface of the ground.

Increase. Miss Jekyll says the seeds take seven years to flower.

Culture. The shoots should be well protected in the spring and the plant mulched over the winter. One of the adventures of gardening is to try to grow this Lily, and to English gardeners it has long been the sport that salmon fishing is to our Izaak Waltons. In the United States I hear it has been grown in Cleveland Heights, Ohio, and that it once grew on a hillside in Massachusetts. It was also grown in Newport, Rhode Island, where it was raised from seed and planted in partial shade (where it belongs).

Var. yunnanense. This variety comes from central and western China, from mountain woodlands, at an altitude of 4000 to 9000 feet. The leaves are often tinged and blotched with brown purple, which gives them a metallic luster. Mr. Wilson says it is less vigorous and smaller than the type.

L. HANSONII LEICHTLIN

Hanson's Lily

It was named after Mr. Hanson of New York, an American pioneer in Lily growing.

Habitat. Korea, and near Vladivostok.

*Description.** An erect, tall stem, 3 to 4 feet high, with a few whorls of large leaves and 9 or more nodding orange flowers whose thick segments are dotted with brown. The top of the stem and unopened buds bend down like the martagons, which they closely resemble. The back of the segment has a raised, green, leaf-like formation which looks as if the calyx had adhered to the petals. The flowers feel so waxy that one expects them to dissolve at the touch of one's fingers. It has a slight musty smell.

Season of Bloom. June, July.

Bulb. 2 inches high and 3½ inches across, the scales snugly overlapping and firmly attached.

Depth of Planting. 6 inches or more.

Increase. The bulbs form clumps. The flowers are self-sterile but sometimes form seed pods, which are full of chaff. They have set seed to pollen of martagon album.

Culture. Hansonii is extremely hardy and has been in my garden seven years, increasing considerably. The mice do not like them. The flowers bleach out in the sun and should, therefore, be in a little shade. The plants and leaves are handsome and the flowers pleasantly odd. I have reports of their being grown at Ottawa, in Vermont, at Harvard, at Granite Springs, Washington, and at Washington, D. C.

Hybrids. The backhouse hybrids originated from crossing hansonii x martagon. Hansonii has been crossed with martagon album.

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* Described from the Hansonii in my garden.

L. HENRYI Baker

Henry's Lily, the orange speciosum

Habitat. Central China, up to 3500 feet altitude. It has been found on limestone cliffs and on grassy slopes of precipices and amongst shrubbery.

*Description.** The stem is dark, reddish, smooth and round, and the leaves are shiny. It is a tall Lily, from 4 to 6 feet high or more. The 6 or more nodding flaring flowers are a clear, soft orange, with emerald green hearts and many horn-like papillae, and a few raised brown spots. The pale green stamens and pistil curve way out and the brown anthers swing loosely. The flowers bleach in the sun.

Season of Bloom. August. The flowers last a long time.

Bulb. Thick with convex, firmly imbricated scales and thick, fleshy base roots. It is deep écru with magenta spots, and turns red on exposure.

Stem Roots. Has stem roots.

Depth of Planting. 10 inches to 12 inches.

Increase. Raised from seeds which germinate readily, only they ripen very late. Forms bulblets on the stem under the ground.

Culture. The stems need staking. It is very hardy and attractive, especially as it comes after most of the Lilies are over. Plant in a little shade. Henryi is grown in Canada and does well and remains healthy all through the United States, from coast to coast north of Washington, D. C., according to my reports; it may, however, do well farther south. It has been in my garden six years and the mice have not touched it.

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* Described from the Henryi in my garden.

L. HYACINTHINUM WILSON

The hyacinth Lily

Habitat. Western China, Sikkim Himalayas. Found in alpine meadows.

Description. Even the dried specimens look charming. The plant is 42 inches high, with long grass-like leaves diminishing toward the top of the stem. The 12 to 24 flowers, like little pendulous bells, are slightly fragrant and arranged in a raceme. They are a soft lilac, and each segment is tipped with vivid green.

Season of Bloom. June, July.

Bulb. Mr. Wilson says that "beneath its membranous tunic it has quantities of small, slightly compressed, brown bulbillae which ultimately form a colony of bulbs."

Increase. From England it is reported as freely producing seeds which ripen well.

Culture. Do not know of its being cultivated in the United States, but it should be grown in the sun. It sounds like something delightful to look forward to, provided it proves hardy.

L. JAPONICUM THUNBERG

Kramer's Lily

Habitat. Japan, on wooded hills, in the mountains at 3000 to 4000 feet altitude. Mr. Wilson says it grows in dense shrubberies and along the margins of woods.

*Description.** The smooth stem is naked at the base and the leaves are sparse and scattered. The flower buds are boat-shaped. The flowers are a lovely shade of pale pink. They are horizontal and form a wide cup the first half and then the segments with their frilly margins spread out and curl around.

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* Described from plants I grew in pots and wintered indoors.

The three inner segments have a green nectar furrow, forming a triangular heart at their base. They are beautiful, delicately colored flowers, of a fragile texture, and the stems require staking. Fragrance like regale, but fainter.

Season of Bloom. June, July.

Bulb. 1 to 2 inches thick. The bulbs travel badly.

Depth of Planting. 5 to 6 inches.

Stem Roots. Has stem roots.

Increase. Offsets are produced freely. Elwes says the seeds live a year before germinating.

Culture. It is best grown in pots, as it is a difficult Lily. Mr. Wilson says it has to be continually raised from seeds. It likes a little shade. It is grown out of doors at Medina, N. Y., at Granite Springs, Wash., and at the Harvard Botanical Garden. I have had the same bulbs for two years in pots which are kept in the cool cellar over the winter. There have been some hybrids between japonicum and auratum which is close to it.

Var. album. A form with white flowers.

Var. albomarginatum. Has light rose-colored flowers and the leaves tinged with white along the margins.

L. LANGKONGENSE Franchet

Habitat. Western China in alpine and subalpine regions.

Description. The stem is ribbed, 3 feet high, and smooth. The leaves are scattered, numerous, and the 3 to 12 nodding flowers are racemosely arranged and are white, flushed with rose purple, and much spotted.

Season of Bloom. August.

Bulb. Is white, stoloniferous, ovoid, and 1½ inches long.

Stem Roots. A mass of them.

Culture. It was introduced into England in 1920, where it flowered at Edinburgh in 1922 from seeds sent by Reginald Farrer, but it is not yet in cultivation in the United States. It is a sun-loving Lily.

L. LEICHTLINII Hooker

Leichtlin's Lily

Habitat. Japan.

Description. The stem is furrowed and from 3 to 6 feet high. The leaves are opposite linear and pointed with a white wooliness. The flowers, sometimes 3 in number, are pale lemon color spotted inside with purple.

Var. maximowiczii.

Habitat. Mountains of Korea and Japan. Mr. Wilson found it growing in black mold alongside streams and ponds, in swampy places and on slopes, always amongst coarse herbs and bushes.

Description. The leaves are from 3 to 7, nerved, and not as woolly as the type. They are very like tigrinum, only have no bulbils in the axils of their leaves.

Season of Bloom. July to early August.

Bulb. 1¼ inches long, stoloniferous.

Stem Roots. The underground stem is covered with roots for about 6 inches.

Depth of Planting. 8 inches.

Culture. It likes a little shade. Mr. Wilson says the variety maximowiczii is a very satisfactory Lily, absolutely hardy in the coldest parts of Massachusetts, and flowers freely. I have tried three times to establish it and it never comes up. Maybe the bulbs meet an early death through the mice. The only report I have of the type being grown is in Granite Springs, Washington.

L. LEUCANTHUM BAKER

The white-flowered Lily

Habitat. North central China, at an altitude of 2000 to 5000 feet, in rocky gorges, in shelter but not shade.

Description. It is one of the Lilies close to regale and sargentiae, but not hardy in the northern climate.

Var. chloraster. I saw a photograph of it at the Arnold Arboretum, and on this they look like marvelous Lilies. The stems are leafy with narrow, sharply pointed, three-nerved leaves, some of them turning down. There are 11 to 15 flowers on a stem, and they have long, waxy, spreading trumpets. It is one of the future beauties of the greenhouse and perhaps for more southerly gardens. Mr. Wilson says it should be planted where it will be dry in winter. He tells that it was raised from seed and flowered in England.

Hybrid. Called L. kewense, now lost, but the parentage was L. henryi x L. leucanthum chloraster.

L. LONGIFLORUM THUNBERG

The Easter Lily

Habitat. Liukiu Archipelago (south of Japan).

Description. This snowy, trumpet-shaped Lily, with a greenish throat and a leafy stem about 18 inches to 3 feet high, is our "Easter Lily." The flowers are fragrant.

Season of Bloom. May, June.

Stem Roots. Has stem roots.

Depth of Planting. 6 to 8 inches.

Increase. Because it is forced in great quantities at Easter time there has been keen interest in discovering the best way to raise it, especially after the breaking out of disease in Bermuda, whence the supply of bulbs was coming from. There is a splendid bulletin, No. 962, August 12, 1921, of the U. S. Department of Agriculture, on this subject called "The Production of the Easter Lily in Northern Climates." Here we read that one has to hand-pollinate each flower and sow the seeds as soon as they are ripe. The plants flower from 7 to 12 months after sowing.

Culture. Longiflorum is not generally hardy north of Washington, D. C., but is grown there and all through the South. I saw quantities of it in the front yards of New Orleans, and it is grown in Texas, Arizona, Mexico, Central America, and Cuba. It likes the sun. It has been subject to disease.

It is a variable Lily and therefore has many named varieties. A few of these are:

Var. eximium. Sometimes called harrisii, and also the Bermuda Lily. This has a narrow perianth and the segments curve back more than the type, the flowers are longer, and the plant taller.

Var. takesima. The same as giganteum, has a black stem and orange anthers.

Var. insulare. The same as var. formosum. This one is now imported from Japan and forced in pots for Easter to replace var. eximium (harrisii).

Hybrid. It has been crossed with regale.

L. LOPHOPHORUM FRANCHET

From western China, not in cultivation.

L. MACROPHYLLUM WILSON

From central Himalaya, close to hyacinthinum, not in cultivation.

L. MEDEOLOIDES A. GRAY

Called Kuruma-yuri, the wheel Lily, by the Japanese.

Habitat. Japan, Korea, and the near-by islands, also in China. Mr. Wilson says, "It grows in thin woods and on the margins of thickets in the open country amongst alpine plants."

Description. It has a whorl of leaves midway up the stem like a wheel. The stem is smooth and hollow, 18 inches or more tall. The 1 to 4 flowers are nodding with reflexed segments of apricot to scarlet and are spotted with black. It is very like distichum.

Season of Bloom. Mid July to early August.

Stem Roots. Has stem roots.

Bulb. ¾ inch across with brittle jointed scales.

Depth of Planting. 3 inches to 6 inches.

Increase. Ripens seed freely.

Culture. It is grown in Granite Springs, Washington, in the semi-shade, and is reported as having a delicate constitution. This is the favorite Lily of the Japanese.

Var. ascendens. With erect or ascending pedicels.

L. MYRIOPHYLLUM FRANCHET

Regale was first mistakenly put on the market as myriophyllum. Mr. Wilson says it is not hardy and he does not know of its being in cultivation anywhere, and that it is a very fine Lily and should be given the same treatment as its variety superbum, known as sulphureum.

Var. superbum:

Habitat. Upper Burma.

*Description.** The leafy stems are sometimes 10 feet high and bear from 6 to 12 flowers. These are white and very long,

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* My description is from plants I grew in pots and wintered indoors.

10 to 12 inches, tubular, with a delicate throat. The outside is tinged wine color and is greenish yellow fading to white. There are greenish bulbils marked with purplish brown in the axils of the upper leaves. It is very like regale and sargentiae, only not as well proportioned.

Season of Bloom. Late in the summer.

Bulb. Brilliant purple red and large.

Depth of Planting. Three times the height of the bulb.

Increase. Through bulbils and seeds. (I do not know how prolifically it seeds.)

Culture. The type is found growing in the open, so I presume the variety is sun-loving too. As sulphureum it has been grown out of doors in Washington, D. C., and in Charlotte, Vermont, where it was grown in rich, slaty loam and where the bulbils flowered four years after planting. It set seed there too.

Hybrid. L. sulphurgale, the parents were L. myriophyllum x regale.

L. NEILGHERRENSE WIGHT

Called the Neilgherry Lily

Habitat. Southern India at an altitude of 5000 to 8500 feet.

Description. The erect glabrous stem is 18 inches to 3 feet high. It has two or more long, narrow, tube-shaped flowers which flare at the mouth. They are cream white with yellow throats, paling to white as they mature. At the Arnold Arboretum there is a photograph of a meadow in India where these Lilies are growing in the blazing sun amongst grasses, with the treeless hills behind them. Mr. Wilson says they are scarce now and that the Lilies are partial to streams and ponds. They are fragrant.

Season of Bloom. July to September.

Bulb. 1¼ inches high, with compact thick scales and a stoloniferous underground creeping stem.

Increase. From seeds which germinate quickly and produce leaflets at once. Also from offsets on the subterranean stem.

Culture. It is growing in Washington, D. C. I should think it would do well in our Southern and Southwestern gardens.

L. NEPALENSE D. DON

The Nepal Lily

Not in cultivation.

L. OCHRACEUM FRANCHET

The ochre Lily

Habitat. South China and upper Burma.

Description. It flowers in May and June and grows where there are heavy rains and no frosts. Mr. Wilson says it is a most variable Lily, so maybe the one I saw was the ugly duckling of the family. It was sent to me by Mr. Scheepers and had flowered in the greenhouse. The nodding flower was green, with a dark red center and red dots and blotches. It looked like an imitation of decaying flesh and had a sickly smell, a repellent Lily.

Bulb. Stoloniferous and 1¼ inches wide and 1 inch high.

Culture. It is not hardy and in the wild is found growing on rocky places amongst grasses and shrubs.

Var. primulinum. This has pale yellow flowers, with green on the outside and no spots, and is vigorous. It has apparently been lost to cultivation.

L. PAPILLIFERUM FRANCHET

Papillae-bearing Lily

From western China. It is not in cultivation that I know of.

L. PHILIPPINENSE BAKER

The Philippine Lily

Habitat. It comes from the Philippine Islands.

Description. The flower has an extremely long, narrow funnel, about 8 inches long, and it is pure white, with a purplish brownish-green tinge outside at the base. The stem is only 18 inches to 30 inches high. An odd Lily. It is fragrant. Philippinense bears fertile seeds, and from seeds sown in March in the greenhouse flowers are produced the following summer. It is not hardy but is unusual, and attractive for the greenhouse or perhaps for southern countries.

Var. formosanum. Comes from the Island of Formosa and grows from sea level up to 10,000 feet altitude. On the sea level it forms clumps and blooms once a month. It is not hardy either nor long-lived, and has to be constantly raised from seeds to keep a supply on hand. In the United States it has been grown in the greenhouse.

L. POLYPHYLLUM D. DON

The many-leaved Lily

From western Himalaya. Mr. Wilson says it is very like duchartrei, and has been introduced a number of times, but always disappears from the gardens.

L. REGALE Wilson

The Regal Lily

Habitat. Western China.

*Description.** The glorious Lily. The gray-green stem is 3 to 6 feet high or more and is clothed its whole length with grass-like leaves, which curl away from it like the strands of an ostrich feather. The flaring white flowers crown its tip, and on old plants there are as many as 25 or 30 to a stem. The flowers bend forward and are so heavy that they cause the wiry stem to bend and sway under their weight. The flowers are white with golden throats and golden anthers and on the back have a colorful rosy penciling, where they join the stem. They are luxuriantly fragrant. The color and the shape vary a good deal. Some of the flowers have quite rippled segments while others are smooth.

Bloom. June, July.

Bulb. Is a deep, rosy, purple-brown on exposure, but creamy yellow when first dug up. A bulb 2 inches will flower, but they grow much bigger.

Stem Roots. It has stem roots.

Depth of Planting. 8 inches to 12 inches.

Increase. The seeds ripen at the end of September or beginning of October and germinate as readily as grass. They often flower the second and always the third summer after sowing. Offsets are formed along the underground stem and the bulbs increase. From twelve original bulbs in 1918 at the Roger Williams Park, in Providence, Rhode Island, there are now between 30,000 and 40,000 bulbs all raised from seed.

Culture. It is extremely hardy and healthy everywhere, and is grown all over the United States and in Canada. The easiest

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* Described from the regales in my garden.

Lily to grow. Does not require staking. Plant in the sun with low planting about its base.

Hybrid. Regale has been crossed with speciosum.

L. princeps Wilson. Resulted from crossing regale x sargentiae — this has some qualities of each and sounds very lovely.

L. RUBELLUM BAKER

The rosy Lily

Habitat. Japan. An alpine at from 2500 to 6000 feet elevation.

*Description.** The stem is naked below with brown markings and is 15 inches to 24 inches high. The flowers are not symmetrical but are shaped like the upward sweep of a ship's prow. They are small and shell pink inside, shot with hazel and deeper colored on the outside. The anthers are gold and the pistil pale gold. The slightly outward flaring segments have pointed tips. They have a faint and distinctive fragrance.

Bloom. June, July.

Stem Roots. Only a few.

Bulb. 1½ inches high and 1½ inches across, scales articulated. It is difficult to procure healthy bulbs.

Increase. Said to ripen seed profusely.

Culture. Miss Jekyll says it is a good Lily for the rock garden. It is grown in Granite Springs, Washington, and Washington, D. C. Mine were raised in pots and did not flower the first year, but did the second and bore enchanting, delicate rose-colored blooms. This is not an easy Lily.

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* Described from the rubellum grown at my place in pots and wintered indoors.

L. SARGENTIAE WILSON

Mrs. Sargent's Lily

Habitat. Western China at 2000 to 5500 feet altitude. Mr. Wilson, who discovered it, says that it grows amongst rank grasses and scrubby woody growth.

Description. A handsome Lily and looks somewhat like regale, but is not as beautiful. The stem is 3 to 6 feet high and needs support. There are bulbils in the leaf axils. The flowers, from 3 to 15, are like white-spreading trumpets and have pinkish brown markings on the back at the base. The inside of the flower is slightly greenish and there is a green nectar furrow way down within it. The coloring is variable and sometimes the flowers are quite rosy outside. The scent has an acrid quality but is not unpleasantly strong.

Season of Bloom. June, July.

Bulb. Yellow tinged wine red. A bulb 1½ inches high and 2 inches wide will produce flowers. They grow much bigger.

Depth of Planting. 8 to 12 inches, according to the size of the bulb.

Increase. Mr. Horsford, who grows thousands of them, says they do not set seed readily, and only one pod was formed out of his whole lot last year, and that was full of chaff. They can be raised from bulbils which are picked off as soon as they are ready to fall.

Culture. It is hardy but subject to disease. Perhaps the available stocks have all come from the same unhealthy source. I have lost mine twice. They should be planted in the sun, with a low growth about the base of their stems.

Hybrid. George Creelman (sargale), which is a cross between sargentiae x regale. Same as princeps.

L. SEMPERVIVOIDEM LEVEILLE

Habitat. Western China, at an elevation of 6000 to 7000 feet on grass-clad mountains.

Description. Looks charming even as a corpse laid out on a herbarium sheet. It is a tiny Lily, 10 to 14 inches high, with sparsely scattered leaves. The flowers are nodding and rose purple. The bulb is 1 inch high and 1¼ inches across. It is not in cultivation.

L. SPECIOSUM THUNBERG

The lance-leaved Lily

Habitat. South Japan, Kiangsi, China, and Formosa.

Description. Sir Joseph Paxton in 1838 in the *Magazine of Botany*, London, enthused not too accurately over it as follows: "Magnificent — on account of the clear deep rose color of its flowers which seem all rugged with rubies and garnets and sparkling with crystal points, but it has the sweet fragrance of a Petunia." The typical form is white, flushed with pink, and spotted with carmine. The stem is about 4 feet high and has fresh green, lance-shaped leaves, and the frilly flowers face downward and carelessly roll back their segments, while the stamens and pistil curl way out. They have a star-like, green, nectar furrow and numerous papillae which are crimson or white crimson tipped. A most beautiful Lily.

Season of Bloom. August and early September.

Bulb. 3 inches high or more.

Stem Roots. It has stem roots.

Depth of Planting. 8 to 12 inches, according to the size of the bulb.

Increase. Bulblets form on the stem just below the surface of the ground and the bulbs increase by doubling. The seed capsules form very late in the fall and the whole stem should be cut off before the hard frosts and the capsules allowed to ripen indoors and the seed planted the following spring.

Culture. Speciosum forces well and blooms in the florist's windows all winter. It looks far handsomer out of doors in a green setting. It likes a little shade and is hardy if healthy plants are obtained. However, most growers report that they have lost it from 2 to 4 years after planting. I have found mosaic on the leaves of my bulbs newly arrived from Japan, which may account for its short stay in most gardens. It is grown extensively in the United States and Canada.

There are many varieties, a few of which are listed here.

Var. kraetzeri. A fine variety with white flowers.

Var. tametomo. Has pure white flowers and is very fine.

The rose and red ones are:

Var. rubrum. Blooms earlier than the type.

Var. melpomene. Is the richest color form, with redder flowers than the type.

L. STEWARTIANUM BALFOUR

Stewart's Lily

It comes from western China. It is a dainty plant, 21 inches high, with slender leaves and has one nodding reflexed flower. It is greenish, profusely spotted maroon, which does not sound attractive. Not in cultivation.

L. TALIENSE FRANCHET

Habitat. Western China, found in subalpine meadows.

Description. It has a roughened stem and leaves, and the nodding reflexed flowers are white spotted purple. The stem is 3 feet or more tall. It looks pretty on the herbarium sheet.

Stem Roots. It has stem roots.

Bulb. 6 inches down and 1¼ inches across

Not in cultivation.

L. TENUIFOLIUM FISCHER

The coral Lily

Habitat. The Altai Mountains through eastern Siberia and northern China, northern Manchuria and northern Korea.

*Description.** A diminutive, jewel-like Lily, from 14 to 18 inches high, with narrow, grass-like leaves, mainly about the center of the stem, and nodding revolute flowers of shiny deep coral red. The tip of the pistil is purplish, like an amethyst in a coral setting, and sometimes there is a bit of greenish brown at the base on the back of the flower. It has a faint scent.

Season of Bloom. June, early July.

Bulb. 1 inch high, taller than wide and smooth.

Stem Roots. It has stem roots.

Depth of Planting. 4 to 5 inches.

Increase. It seeds freely and these can be sown as soon as they are ripe in the fall and will come up thickly the following spring. They often flower the second summer after sowing. One should keep up a supply by raising seedlings every year.

Culture. Tenuifolium is absolutely hardy and likes the front of the sunny border, and I should think would do well in the rock garden. It is said to die out after a few years, but Miss Preston reports that she has noticed a clump which has persisted for a number of years. They require staking when in flower. This Lily is being grown in Washington, D. C., in Vermont, New York, Ottawa, and Washington, that I know of.

Var. golden gleam. The stem is a little taller and the flowers are orange color. Last year one of my home-raised plants bore

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* Described from the tenuifolium in my garden.

25 flowers and was 30 inches high, and this year one plant has a U-shaped stem, one arm of which is bearing 26 blossoms and the other 22. This is supposed to be a hybrid, but as I have raised quantities of them from seed, and as they always come true, I think it must be a variety.

There is a white-flowered variety too.

L. THOMSONIANUM ROYLE

Habitat. Western Himalayas.

Description. The stem is 3 feet tall, and carries a long raceme of pale, rose-colored flowers tinged with violet. They are funnel-shaped and fragrant and from 18 to 30 on a stem.

Season of Bloom. End of March to May.

Bulb. Forms annually anew and grows many new bulblets between the scales of the decaying bulb.

Culture. It is seldom seen in America, but is grown on the continent in Europe. M. Truffaut says that at Ghent it is grown in front of a south wall and mulched with leaves in winter, or grown in pots and brought indoors in winter. Seeds of it have been distributed here in the United States and some were sent to me, but they perished probably from being mistakenly left out of doors over the winter. It sounds like an attractive but not a very hardy Lily.

L. TIGRINUM KER-GAWLER

The Tiger Lily

Habitat. Japan, Korea, and eastern China.

Description. Tigrinum is the hardiest of all Lilies. It thrives anywhere and has left the sheltered life of the garden to fight its way in the free for all roadsides where they are sufficiently numerous to appear like natives. There are lusty clumps of them in many a Vermont or Massachusetts dooryard. The hairy stems are 3 to 4 feet high and carry great numbers of pinky orange flowers, whose segments curl way out. The flowers are spotted with purplish black and have orange papillae, some of which are tipped with purplish black. There are bulbils in the axils of the leaves.

Season of Bloom. July, August.

Bulb. Smooth and creamy, cultivated as a vegetable in China.

Stem Roots. Mats of them.

Depth of Planting. 8 to 12 inches deep.

Increase. Through bulbils and the doubling of the bulb. The bulbils flower in three years after planting. Tigrinum is sterile to pollen of its own kind.

Culture. Grows both in sun and a little shade. Although it is handsome I find it a little coarse for the flower border, and like it better bordering paths and driveways or in front of a shrubbery.

Var. fortunei. The stem is clothed with cottony pubescence and it flowers earlier than the type.

Var. splendens. Hairier than the above, brighter in color, and flowers later than the type.

Var. florepleno. Double, handsome.

There are other varieties.

Hybrids. Miss Preston got crosses of: tigrinum x willmottiae and tigrinum x maximowiczii.

L. TSINGTAUENSE Gilg

Chosen-kasa-yuri (Korean wheel Lily)

Habitat. Korea, Shantung, China. Found in the woods and in moist, shaded situations.

Description. It resembles distichum and medeoloides in having a wheel-like whorl of leaves. Mr. Wilson says the Chinese admire these Lilies. This Lily has one whorl of leaves two-thirds of the way up the stem, and the erect flowers are orange and spotted.

Season of Bloom. August.

Bulb. ¾ to 1 inch high.

Stem Roots. It has stem roots.

Depth of Planting. 2 to 3 inches.

Culture. Not in cultivation in the United States that I know of. There are two varieties of it.

L. WALLICHIANUM Schultes

This Lily comes from the western Himalayas, at an altitude of 3000 to 4000 feet. Mr. Wilson says it grows wild on open, grassy hills. It is a creamy, tubular Lily, green without, and has a stoloniferous, underground stem. Not in cultivation in America that I know of.

L. WILLMOTTIAE Wilson

Miss Willmott's Lily

Habitat. Central China, at an altitude of 4000 to 8000 feet, on the margins of thickets and woods.

Description. Willmottiae looks like a smaller, refined tigrinum. The hairy stem is 30 inches high, and is weak and needs support. It carries from 3 to 25 nodding, open, reflexed flowers, which are pinkish orange with purplish brown spots. Its pink style and filaments curve way out. The pollen is orange.

Season of Bloom. June, July, a little ahead of davidii, which it closely resembles in looks.

Bulb. 1¼ inches broad and the same in height. It has a stoloniferous, underground stem, which is said to creep for a foot or more underground. The bulb is eaten by the Chinese.

Depth of Planting. Three times the height of the bulb.

Stem Roots. It has stem roots.

Increase. Readily grown from seeds which flower the third summer and form bulbs which grow along the underground stem, and flower the second summer after planting.

Culture. Willmottiae is very hardy and is being grown in Vermont, Massachusetts, Washington, and New York, that I know of. It should be planted amongst slender perennials or annuals, where it receives a slight shade.

CHAPTER XIII

GRAPHS AND STATISTICS

TO find out which Lilies were being grown in various parts of the country and whether they were thriving or languishing, I sent out a questionnaire to which I received thirty-three answers. The questionnaire asked: How long the Lily had been grown and whether in sun or shade; in what kind of soil; whether it had become diseased; if it had set seed; had the grower raised seedlings. I have included the answers under the descriptions of the individual Lilies. The replies were most helpful and made it possible for me to add the experience of other gardeners to my own for the benefit of all.

Sending out the questionnaire made many new friends for me, and I was delighted to come across a lady who was growing washingtonianum, parryi, japonicum, brownii, and other generally difficult Lilies very successfully in western New York. My Lily friends were most kind and one of them telegraphed me when the neilgherrense was in flower in his garden since he knew I had not seen it. So I traveled to Washington to look at the visitor from far away blooming as if quite at home in the strange country. There, on a broiling July day, three Lily fans generously spent hours showing their treasures and explaining to a stranger, whose only bond was a mutual love of flowers, what they had done and especially what they hoped to accomplish. Another friend sent me the newly introduced kinds as they bloomed in his greenhouse so that I could see them and describe them.

Those who answered questions were actively interested in Lilies and many were professional growers or scientists. Amongst them were Miss Isabella Preston of Ottawa, Mr. H. E. Allanson and Mr. Roy E. Pierce (who grows thirty-six kinds), both of the Department of Agriculture at Washington, Mr. Stephen Hamblin of the Harvard Botanical Garden, Mr. C. H. Fray of Granite Falls, Washington, Messrs. C. B. and F. Horsford of Vermont, and Mr. W. N. Craig of Weymouth, Massachusetts. The list of Lilies grown by Dr. Stout of the New York Botanical Garden, who first gave me the idea of working with them, was taken from his publications and is included in my chart.

Forty-seven species, not counting varieties, are recorded. Many more are being grown for which there are no reports, as the growers who answered felt they did not have a sufficiently long acquaintance with those species to report on their behavior.

Regale was grown by more people than any other

Lily, with candidum and auratum tying for second place; and henryi was third; speciosum, canadense, and superbum tied for fourth. Strange to say, the hardiest of them all, the tigrinum, only came in fifth.

I found twenty-five species to be hardy in my garden out of doors and grow two more which I keep indoors over the winter. There are fifteen other species which have only been in the garden one or two years and either have not yet bloomed or only imperfectly. Lilies seem to thrive up here on our hilltop where it is so exposed to wind and cold that our trees and flowers are ten days later than in the Hudson Valley, only six miles to the west of us. Our greatest peril is the fickleness of spring, so warm one day that we sit out of doors glorying in the sun, and so cold the next that we shiver close to a fire.

Alongside of the Lilies grown by gardeners I have tabulated those listed in the catalogs. I took these figures from twenty-one catalogs of the dealers whom I knew offered reliable bulbs. Two of these sell to the wholesale trade only, the rest are retail. Excepting one Japanese, one Dutch, and one English firm, all are American. The facts they revealed are satisfactorily astonishing. There are more Lilies listed in the catalogs than are recorded as cultivated by growers, for they total fifty-eight species, forty-eight varieties, and five hybrids. This, however, does not mean that there are one hundred and eleven kinds, for in the present confusion of nomenclature when a Lily like speciosum, for example, is listed, one cannot be sure whether it is the type speciosum or a variety that is meant. So where I have speciosum on the list I noted "six varieties" under it, which means that six names are listed; but not that seven kinds, the type and the six varieties, are sold. Most likely each of the seven is not distinct because two or even three names may be used in different catalogs for the same variety.

With forty-eight species now on the market to choose from, the prospective purchaser is not limited in his selection.

The chart shows that some species, which we are told are absolutely hardy and easy to grow, are being offered by one or two firms only, for example, medeoloides, duchartrei, callosum, coridion, and cernuum.

One species, the neilgherrense, is being grown, but it is not in any catalog and there are several more, like thomsonianum, which have not been included on the chart but are of great promise.

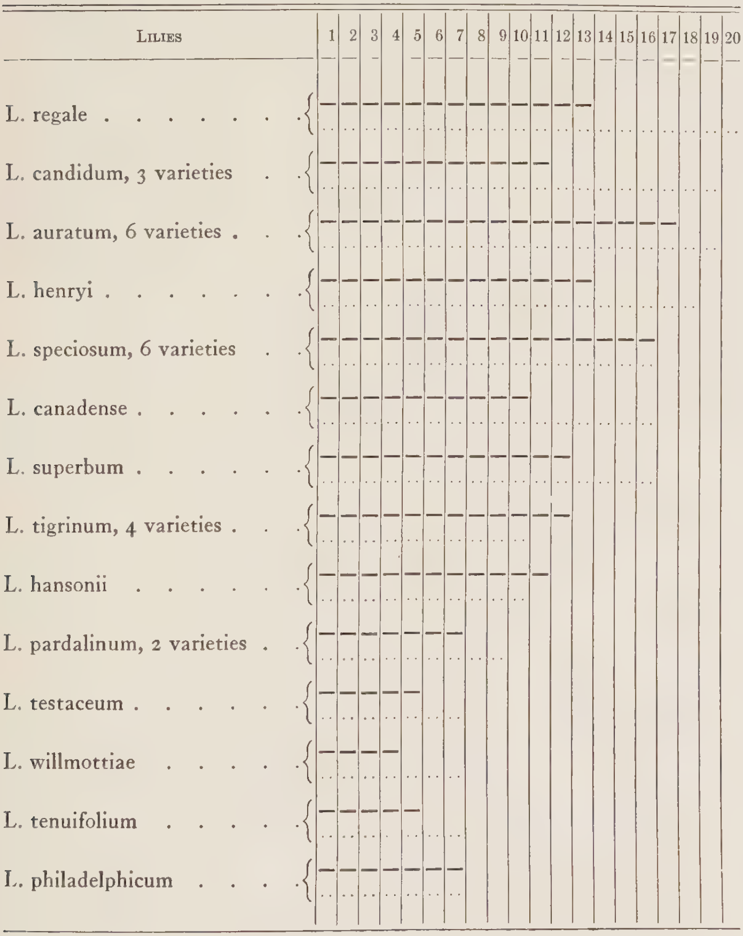
Auratum appears most frequently in the catalogs, with speciosum second and regale third, henryi fourth, and then superbum, tigrinum, candidum, hansonii, canadense, and the others following after. It is surprising to find how popular are canadense and superbum. Possibly the explanation for this is that the collectors of native plants have pushed them.

The chart explains why people have not been as successful as they should have been in growing Lilies, when auratum and canadense, which I do not consider the hardiest (as they are both subject to disease), stand near the head of the list, and such lusty Lilies as tigrinum, humboldtii, croceum, and elegans are way down. By increasing the cultivation of the hardy Lilies and culling out the difficult and delicate ones, the Lily grower's chart will soon present a different appearance.

LILY GROWERS' CHART

.... Number of gardeners growing the species — 33 gardeners answered.

—— —— Number of nursery catalogs listing it — 21 catalogs.



LILY GROWERS' CHART — *Continued*

Lilies	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L. croceum	—	—	—	—	—	—														
		…	…	…	…	…	…													
L. longiflorum, 5 varieties	—	—	—	—	—	—	—	—	—											
	…	…	…	…	…	…	…													
L. martagon, 3 varieties	—	—	—	—	—	—														
	…	…		…	…	…	…													
L. washingtonianum	—	—	—	—																
	…	…	…		…	…														
L. sargentiae	—	—																		
	…	…	…	…	…	…														
L. parryi	—	—	—	—																
	…	…		…	…															
L. humboldtii, 3 varieties	—	—	—	—																
	…	…	…	…	…															
L. grayi—some of this is canadense and rubrum	—	—	—	—	—	—														
	…	…		…	…															
L. elegans in variety as many as 9 listed by one nurseryman	—	—	—	—	—	—	—	—	—											
	…		…	…	…															
L. batemanniae	—	—	—	—	—	—	—	—	—											
	…		…	…	…															
L. brownii, 2 varieties	—	—	—	—	—	—														
	…	…	…	…																
L. japonicum	—	—	—	—	—	—														
	…	…	…	…																
L. umbellatum	…	…	…	…																
L. concolor	—	—																		
	…	…	…	…																
L. columbianum	—	—																		
	…	…																		
L. davidii	—																			
	…	…	…																	
L. myriophyllum, var. superbum under sulphureum	—	—																		
	…	…	…																	

LILY GROWERS' CHART — *Continued*

Lilies	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L. monadelphum, szovitzianum	—	—	—	—	—															
	...	...	...																	
L. davuricum	—	—	—	—																
	...	...	...																	
L. parvum	—	—	—																	
	...	...	...																	
L. rubellum	—	—	—	—	—															
	...	...	...																	
L. wallacii, belongs under elegans	—	—																		
	...	.																		
L. pomponium	—	—	—																	
	...	...																		
L. philippinense	—	—	—	—																
	...	...																		
L. giganteum, 4 list it but 3 of them mean longiflorum	—																			
	...	...																		
L. chalcedonicum	—	—	—																	
	...	...																		
L. bulbiferum	...	...																		
L. rubescens	—	—																		
L. pyrenaicum	—	—	—																	
	...	...																		
L. bolanderi	—	—	—																	
	...	...																		
L. carolinianum	—	—	—																	
	...																			
L. kelloggii	—	—	—																	
	...																			
L. leucanthum var. chloraster under centifolium	—	—																		
	...																			
L. leichtlinii, 2 varieties	—	—																		
	...																			

LILY GROWERS' CHART — *Continued*

Lilies	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L. maritimum	—	—	—																	
	..																			
L. medeoloides	—																			
	..																			
L. neilgherrense	..																			
L. roezlii	—	—	—	—																
	..																			
Backhouse hybrids	—	—																		
	..																			
L. duchartrei	—	—	—																	
L. coridion (Wilson says it is concolor), 2 varieties	—	—																		
L. bakerianum	—																			
L. callosum	—																			
L. cernuum	—																			
L. cordifolium	—																			
L. amabile, several are growing it from seed	—																			
White Knight	—																			
L. sulphurgale	—																			
L. batemanniae	—																			

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